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A PHILOSOPHICAL
ESSAY ON MAN.
R
BEING
AN ATTEMPT
TO INVESTIGATE THE
PRINCIPLES AND LAWS
OF THE
RECIPROCAL INFLUENCE
OF THE
SOUL ON THE BODY.
[and]
VOL. I.

Unde animi constet natura, videndum.
LUCR. DE NAT. RER.

L O N D O N:
Printed for J. RIDLEY, in St. James's Street; and
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A THEORETICAL
ESSAY
ON THE

R. F. BAIRD

THE AUTHOR OF "THE
POWER TO SUPERINTEND THE
TO INVESTIGATE THE
THE CANDID READER WILL PERCEIVE, AND
PRINCIPLES OF THE WORK
THE FOLLOWING ARE IN THE

OF THE

RECIPROCAL INFLUENCE

OF THE

SOUL ON THE BODY.

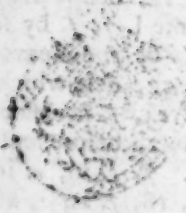
VOLUME I



LONDON:
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T. Evans, near St. Paul's Church.
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TO THE
READER.

THE Author not having had it in his power to superintend the Press, begs the candid Reader will pardon, and, before he begins the perusal of this work, correct the following errata in the text.



ERRATA.

- Page 1. Title, *for* Soul and the body, *read* Soul and Body.
 viii, line 23, *f.* soul and the body, *r.* soul and body.
 x, l. 15, dele the s in metaphysicians.
 xiii, l. 24, *f.* free-being, *r.* free being.
 xviii, l. 15, *f.* writers best, *r.* best writers.
 35, l. 20, *f.* climentary, *r.* elementary.
 39, l. 3 and 4, *f.* this principle, *r.* these principles.
 l. 10, *f.* extenal, *r.* external.
 l. 11, *f.* this, *r.* their.
 40, l. 3, dele may,
 l. 21, *f.* constrution, *r.* contraction.
 42, l. 12, *f.* eve- one, *r.* every one.
 43, l. 12 and 13, dele itself.
 45, l. ult. *f.* the heat, *r.* heat.
 55, l. 21, *f.* vous, *r.* nervous.
 56, l. 15, *f.* motions, *r.* motion.
 69, l. 3, *f.* phenomena, *r.* phenomenon.
 84, l. 9, *f.* an immediate, *r.* a mediate.
 97, l. 1, *f.* motives, *r.* motions.
 l. 3, *f.* as, *r.* are.
 l. 16, *for* those, *r.* these.
 106, l. 20, *f.* the solid, *r.* of the solid.
 110, l. 26, *f.* phenomena, *r.* phenomenon.
 114, l. 2, *f.* it does, *r.* they do.
 118, l. 11, *f.* fibrillæ, *r.* fibres.
 l. 15, *f.* these fibrillæ, *r.* the fibres.
 l. 26, *f.* original, *r.* organic.
 134, l. 21, *f.* the head, *r.* from the head.
 142, l. 16, *for* the human heart is, *r.* is the human heart.
 l. 22, *f.* works, *r.* marks.
 144, l. 25, *f.* and, *r.* live in.
 146, l. 16, *f.* does, *r.* do.
 146, l. 3, *f.* those virtues, *r.* pity.
 147, l. 12 and 13, *f.* proportion, *r.* manner.
 151, l. 18, *before* *Hesperides*, *r.* the
 160, note l. 7, *f.* by some, *r.* to some.
 164, l. 6, *f.* endeavour, *r.* endeavours.
 182, l. 22, dele which.
 184, l. 14, *f.* occasions. *r.* occasion.
 188, l. 2, *before* sensitive, insert unfolding of the
 199, l. 7, *f.* in, *r.* into.
 214, l. 18, *f.* is, *r.* acts.
 220, l. 11, *f.* are, *r.* appear.
 224, l. 25, *f.* black, *r.* swarthy.
 237, l. 5 and 6, *after* lustre, *r.* though we are.
 l. 15, *f.* deludes, *r.* eludes.
 267, l. 22, *f.* in, *r.* with.
 l. 27, *f.* resolution, *r.* mind.
 269, l. 22, *f.* a necessity, *r.* necessity.
 270, l. 21, *f.* often, *r.* ever.

P R E F A C E.

AMONG all the agreeable and interesting sciences, the most cultivated, and the least improved, is certainly that of Man. How many systems have been invented! How many volumes written upon this subject! And what a multitude of absurdities involve the few truths that have been published thereon!

Let us take a cursory view of the history of this part of human knowledge. Since men first entered on the study of nature, Man has been the particular object of their enquiries. A subject so noble and so interesting, was too important not to engage their chief attention. But as they were destitute of every light, their knowledge of Man, as of the rest of the universe, was confined to a few superficial and imperfect observations. The first, who made Man their study, undoubtedly believed him to be wholly corporeal; and they who succeeded, rather guessed, than demonstrated, that some other substance, besides the body, entered into the composition

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sition

iv P R E F A C E.

fiction of his being. Mankind had then made no curious disquisitions in science; they knew but very little of things; and metaphysical knowledge, then in its dawn, could not supply those profound and subtil arguments, which some modern philosophers have employed, to prove that Man is not wholly material. This profound ignorance of the first age was likewise the lot of the subsequent, and men, for a long time, only suspected they possessed a soul, so far were they from being able to convince themselves of its existence, and so entirely ignorant of its nature. But let us pass over those dark and unknown ages, and descend to more enlightened times.

In Greece, that nursery of the arts and sciences, where the faculties of the mind were so amazingly improved in various branches of knowledge; philosophers were continually discoursing of soul and spirit, but without annexing to these terms any idea of spirituality. The most distinguished, as Aristotle, Socrates, Plato, Diogenes, Epicurus, agreed in affirming the soul to be a spirit; but this spirit was believed by all to be a thin subtil matter.

P R E F A C E. v

ter. Thus, for want of accurate observations, philosophers were stopped short in their first attempt, and all their knowledge was confined, like that of the herd of mankind, to the distinguishing their own species from that of brutes, by the configuration of the body.

In process of time, philosophers made farther researches, but without rule, and without any principles to guide them: instead of previously examining what they were desirous to know, they began with defining the matter of which they as yet had no idea; astonished at the phenomena of the human mind, they represented Man rather after their own imagination, than after nature. Some doubted whether they should not exalt him to the condition of a god; whilst others were for degrading him to a state inferior to the beasts.

Time, which produces such revolutions in opinions, wrought no great alteration; and the science of Man, in passing from one country to another, carried all its errors along with it, without acquiring any new truth.

The Grecian philosophers understood Man no better than their masters, the Egyptians;

tians; nor were the acquirements of the Romans, in this science, greater than those of the Greeks, notwithstanding the many fine things written by *Cicero*, *Seneca*, and others florid writers on this subject.

At first they knew not Man, and afterwards could not. Priests who, from a principle of self interest, have ever made it their business to mislead mankind, and, in the name of the Gods, to sanctify ignorance and error, feigned many absurd tales concerning Man, his genesis, his nature, and the end of his creation. From that time, the chimeras of fable were intermixed with the feeble lights of philosophy, already too much involved in error. And Man was believed to have been formed *after the image of the gods*, and *his soul to be a particle of the divine nature*. The age of ignorance was of very long duration. Darkness increased and fables were multiplied. Hence Man, thus bewildered and enslaved to those heavenly bugbears, had not even a desire to know himself.

A short time since, some philosophers, ashamed of so dishonourable a servitude, tore off the bandage with which superstition had obstructed their sight, and turned
their

their eyes inwards on themselves. But, as the science of Man was intricate and mysterious, to recover it from that darkness in which it was then involved, it was necessary to have recourse to observation. They therefore contemplated Man, but contemplated him imperfectly. Many afterwards published their thoughts upon this subject; thoughts altogether frivolous and vain, and which might, for the most part, be reduced to some trivial maxims.

The science of Man, hitherto treated in a vague and too general manner, was now resolved into its constituent parts. These were divided and studied separately. Anatomists examined the corporeal, and philosophers, the spiritual part: Philosophers distinguished sentiment from thought, made them two separate sciences, the knowledge of the mind or intellect, and the knowledge of the heart or affections, and divided the two provinces betwixt them. Metaphysicians appropriated the former, and moral philosophers the other.

Among those who have best succeeded in these different branches, are Locke, Rochefoucault, and Winflow.

viii P R E F A C E.

Rochefoucault has examined the passions of the human heart, and has displayed their nature and principles indifferently well.

Locke has treated of the mental faculties, and has well investigated them.

Winslow has considered the physical part, and has handled it much better than the others have the spiritual.

Accordingly modern philosophers have succeeded better than the ancient. But their observations being made by men whose talents and pursuits were different; by metaphysicians who were not anatomists, and by anatomists who were not metaphysicians; these were therefore unconnected, and the science of Man consisted wholly in a number of scattered ideas. Accustomed to consider the phenomena independent of their mutual connection, they, who applied themselves to the study of this science, perceived not the causes of the reciprocal influence of the soul on the body, and even the relations between these two substances, almost entirely escaped their observation.

Doubtless much had been already done; but the chief difficulty yet remained to be overcome. The faculties of the
soul,

soul, and the mechanism of the body were known, but not the whole Man as compounded of both. No one had yet accounted for the singular relations between the two substances which compose his being; scarce any one had noticed their wonderful influence on each other.

Man therefore was considered as an enigma, as an impenetrable mystery. Philosophers, poets, orators, all expatiated on that contrast of meanness and greatness; that medley of folly and wisdom; those sudden changes; those perpetual revolutions in the soul, which offer themselves to every ones observation, instead of attempting to investigate them and to discover their causes. But this work was not easy to be performed. To render these phenomena more marvellous, it was sufficient to select some contrasting and seemingly inconsistent situations. To elucidate them, it was necessary to study Man; to see him in every circumstance; to observe carefully the reciprocal influence of the physical on the moral part, and to discover the reason of this influence.

This study seems to have been reserved for physicians, whose profession qualifies them

x P R E F A C E.

them for making such observations; and who, being called to relieve the sufferings of mankind, can contemplate the soul in all its various situations, and surprize it, if I may be allowed the expression, in every degree of misery or greatness. Accordingly physicians were the first who dared to enter upon this intricate science. Philosophers followed their example. Every one formed his observations separately; but as they had not gained a sufficient number of principles, and did not unite the discoveries of the anatomist with those of the metaphysicians, they made but few, and those very trivial observations. The spirit of system afterwards spread its dark veil over this dawn of knowledge, and the philosophers of that age fell into the same errors with their predecessors. Before they had made a sufficient number of proper observations, they attempted to account for those phenomena which they observed, and by the little they knew, guessed the rest; they built systems, and instead of deducing them from their observation, they wrested their observations to quadrate with their systems. One endeavoured to
explain

P R E F A C E xi

explain every thing by physical, another by moral causes, and every one, for want of having comprehended the whole, and by being wholly confined within the narrow limits of his own knowledge, was constrained to treat this subject in a vague indeterminate manner, and to explain the phenomena by imaginary relations and by ridiculous hypotheses: so that whilst they believed themselves sure of having attained *Truth* in one instance, it escaped them in many others. Among these philosophers, some desirous to pass for men of wit, sacrificed truth to brilliancy of thought, and good sense to elegance of expression. Thus, of their systems, some were absurd, others imperfect, and all rather singular than just. But as my bare asserting these facts will not suffice, I proceed to offer the proofs of them.

Galen, and before him *Hippocrates*, observed some phenomena concerning the reciprocal influence of the body on the soul, but believed the soul to be material; whence their observations are but little worth.

Montagne in his *Essays*, *Robinson*,* *Boerhave* and *Hoffman*†, have left a few ob-

* Thomas Robinson. † Frederic Hoffman the younger.
servations

servations on the reciprocal influence of the body and the soul; their views, however, were very confined, nor has any of them attempted to elucidate these phenomena.

Des Cartes was the first who undertook the task; but as his anatomical knowledge was very imperfect, and his metaphysical notions erroneous, he fell greatly short of his aim. He first confounded the impressions of external objects on the senses with the ideas of the mind, and then made the different affections of the soul to consist in modifications of the animal spirits; he assigned different parts of the head for the seat of the different mental faculties, and allotted to every idea a particular tube of the brain*. From the action of these spirits, differently modified, on the different organs, he accounted for every operation of the soul, viz. thought, judgment, good sense, imagination, memory, and remembrance. Finally, from the different motions of these spirits, he deduced the order or the confusion of our ideas. Thus ever hurried along by a warm imagination, instead of explaining the

* In his work intituled *L'homme*, Lib. 4.

phenomena of nature, he has given only idle dreams, and contented himself with empty notions.

To *Des Cartes* succeeded *La Metrie*, in a small work *, the design of which is not easily discovered. Notwithstanding his learning, and the assistance he might have received from his profession, he appears to have observed nature not as a philosopher, but as an illiterate man. Almost always led astray by appearances, he penetrated no farther than the surface in search of truth; so that if we reduce his book, which has been so highly commended by atheists, to its just value, it will be found to be a sorry collection of trivial observations, and of false metaphysical reasonings on the soul and its faculties; and, in a word, to be a system wherein the author, without attempting to account for the reciprocal influence of the soul on the body, reduces every thing to the latter of these substances, and believes a thinking and free-being, susceptible of virtue and remorse, to be wholly material.

Secondat de Montesquieu, a man in whose mind, delicacy, sagacity and depth of

* Intitled *L'homme Physique*.

thought

thought were so happily blended, touched lightly upon this subject in his *Spirit of Laws*. Of all those who have treated thereon, he was the first that despised the unintelligible Jargon of Pſycologists, and reduced the study of Man to that of nature. As he was a judicious observer, and an excellent judge, he has thrown some light upon the thick darkness in which these matters were involved, and could discern amidst its obscurity the path which would have conducted him to truth. In the slight sketch he has left us, we discover the great philosopher; and from the little we have, we can judge of the whole design, and regret that so great a genius, did not favour the world with a complete treatise on this subject, instead of the faint outlines he has left us.

But among all the authors who have embarked in this attempt, *Helvetius* is perhaps the only one who undertook to handle this subject without any skill in anatomy, any proficiency in physic, or knowledge of the reciprocal influence of the soul on the body. Nay more, he has even written with a professed design to demonstrate the uselessness of these helps, towards acquiring the knowledge

ledge of Man *. Being of an erroneous and superficial understanding, he first builds a system, by which he absurdly attempts to reduce every phenomenon in Man to moral causes; and then confidently producing this as the only true and natural system, he proceeds to glean from history some scattered passages and particular cases to confirm his opinions, and tortures his mind to wrest the phenomena to his purpose. Hence his work is only a series of sophisms, elaborately adorned with a pompous display of useless erudition.

Haller, a celebrated physiologist, has likewise treated this subject, but with no better success than his predecessors. At his first outset he wanders from nature, and afterwards makes vain and laborious efforts to arrive at truth. Having no clear knowledge of metaphysics, he confounds the faculties of the mind with the properties of matter; after assigning the cerebrum as the seat of the soul, and as the sole organ of its operations, he labours to deduce

* This is more to be wondered at, as he makes sensibility and memory two physical faculties, which, according to him, are the only faculties of the soul. See ch. i. of Discourse i.

from the different degrees of consistence in this *viscus*, and from the diversity in the circulation of the blood in its fibres, the reason of the phenomena relative to the influence of the physical on the moral part in man. Hence we discover throughout his immense work no light whereby to demonstrate the reason of these phenomena; and his ideas are a chaos as dark as the subject he undertook to clear up appears to have been to himself*.

Le Cat, the last of the moderns who engaged in this enterprize, seems to have exhausted all his art on his subject. As he was a skilful anatomist, he possessed one part of the knowledge which must form the basis of the edifice. And being an attentive observer, he closely applied himself to the study of nature, and probably would have penetrated far into its arcana, if, to his physical knowledge, he had joined the lights of sound psycology; if he had used more accuracy and attention in his observations; and had he not been so much possessed with the frenzy of systems. But as he wanted these aids, he failed

* See the beginning of the 17th Book, in the fifth volume of his Physiology.

failed in his design, and missed of that truth, which he believed he had attained to. It is true, we find in his works some good observations, and some scattered rays of light; there is even an appearance of something like principles. But from his improper application of them; from his not being able to account for the phenomena which occurred to him, and were the consequences naturally arising from them; and from his confused theory, we easily perceive, that the author was altogether unacquainted with nature; as well as with the extent, and consequences of her laws: so that the knowledge of Man, which he pretends to teach, is so imperfect, so obscure, so little developed, that truth itself appears hypothetic under his pen. Besides, as his genius partook more of the elegance of a lover of poesy and of polite literature, than of the manly force of a close reasoner, his particular aim was rather to give his subject an agreeable air, than that strength and majesty which form its proper character*; and he sought more

VOL. I.

B

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* I make not this remark to blame erudition in philosophical works; on the contrary, well employed, it is very ornamental: what I mean is, that erudition ought not to be the principal, the only merit.

to compose a work valuable for its erudition, than for its solidity and sublimity. Hence his writings are embellished with elegant anatomical descriptions *, and are filled with abundance of curious passages, in which their principal merit consists. These are the principal authors who have written on this subject; and who may justly be classed among the foremost in point of reputation.

There are others who have engaged in the same pursuit: but, except the small number already mentioned, none are worthy of notice.

From the writers best upon this subject, we may select some few observations that are just, and meet with some feeble light thrown at times over particular points; but the whole amounts only to some slight elucidation of a small number of phenomena. Some of these philosophers have discovered a few particular causes of the reciprocal influence of the soul on the body, but were all of them wholly ignorant of its great and leading principles; they have discovered some branches, but the

* See Treatise on the Sensations and Passions in General.

source was entirely unknown. Thus if all the just observations scattered throughout their writings were collected, they would only form a system without a basis, and without any connection of its component parts. Truth, concealed in their writings under a cloud of errors and absurdities, appears with the air of mere opinion, whereas it might have had the force of demonstration with every characteristic of absolute certainty.

As all these different systems are ill combined, ill grounded, and do not carry conviction, philosophers have not adopted them. On one hand, struck with the contradictions which they perceived between nature and the principles laid down by authors; and on the other, astonished at the variableness of the human mind, the causes of which were entirely unknown; discouraged by the ill success of others, and moreover unable to distinguish truth from darkness, they have not attempted to elucidate the smallest phenomenon.

Thus for want of proper information, they were for confounding every thing, and treated every opinion indiscriminately

xx PREFACE.

minutely as ridiculous, every system as absurd, and even the design of searching into nature as presumptuous. They proudly entrenched themselves behind their own ignorance, saw prodigies in the most simple facts, and looked upon the knowledge of Man as an enigma, as an impenetrable mystery, a labyrinth whence there was no issue*. Thus what they have written on the subject of Man, is no more than pompous inanity. With them, all is mystery, all is inscrutable; ever in an ecstasy, they shut their eyes against the truth, and contented themselves with a stupid admiration.

So that at present, mankind may be said to consist of two sorts of beings; the vain and presumptuous, who are for assigning reasons for every thing, even at the expence of good sense and experience: and the timid and credulous who are in a perpetual ecstasy of wonder at all they behold. We may therefore conclude, that except a few scattered rays of light diffused over some particular phenomena, the science of Man is hitherto entirely unknown,

* For proofs of this, read the works of Hume, Voltaire, Bonnet, Racine, Pascal, &c.

But

P R E F A C E. xxi

But when the greatest geniuses have been diffident of succeeding in handling this subject; when so many great men have failed, and others have not dared to engage, shall I hazard the undertaking, presume to penetrate this palpable obscurity and fathom this profound abyss? What talents, what study, does such a task require! What a fund of observation; what address to reconcile so many seemingly inconsistent appearances, discover their connection, and amidst such a complication of facts, discern that light which explains those principles which unveil and account for them! In a word, by the help of a glimmering taper, to discover such a multiplicity of undiscovered truths! How bold the enterprize, how difficult the execution!

These reflections are discouraging I confess, and especially when I consider the mediocrity of my talents; however, they shall not make me renounce my resolution. Neither the difficulty of the enterprize, nor the ill success of those who have preceeded me; nor the general prejudice, that it is impossible to succeed, shall prevent me from attempting

xxii P R E F A C E.

it. Had men always yielded to despondency, truth would have still remained buried in obscurity, and the most important discoveries had been yet to make.

Whether I have succeeded, the impartial public will best determine. I plead no other merit than the intrinsic utility of the design: what that is, I now proceed to inform my readers.

Man is but little known, because improperly studied; the reason of which is, that no one, who has made the attempt, has followed nature. Instead of taking experience for their guide; instead of proceeding by just observations to lay down a general system, of which every phenomenon was a necessary consequence, philosophers have acted directly the reverse: they have invented systems, wrested the phenomena to conform thereto, and forced nature to submit to their opinions. I have endeavoured to avoid their error: as a simple observer, I establish no system till the necessity of facts obliges me thereto.

For Man to presume, like the Creator,
to

to read what passes in the soul, is an absurd vanity; accordingly every attempt of metaphysicians with this view has proved unsuccessful. As this principle acts internally, as it is imperceptible by the senses, and cannot be seen but thro' the medium of the body, with which it is intimately united; by disregarding the body, which is, as it were, a kind of cloathing to the soul, and a covering which must first be removed, we frequently attribute to the soul properties which belong to the body: thus ever judging from appearances, and never seeking to penetrate deeper, we fall short of truth, and neglect the only mean which can conduct us thereto. We must therefore endeavour to penetrate to the soul through the integuments of the body, and observe the influence of the material substance upon the spiritual, to be able to distinguish the properties peculiar to it, from such as are dependent on a foreign principle.

As the body is an extremely complicated machine, to form a sound judgment of a single spring, make a just estimate of the influence of one part upon another,

and of every part upon the whole, discover the true relations between effects which appear remote, and connect particular phenomena with their general principles, we must first be acquainted with the structure of the whole machine. The anatomist, therefore, must lay the foundation of the edifice; he alone can investigate the secret springs which act upon the soul, affect it so strongly, and of whose existence the generality of mankind have no idea. I therefore begin by introducing my reader to the physical knowledge of the human body. I describe Man as an hydraulic machine, and as a compound of vessels and fluids; I then enter into a particular examination of these vessels, of these fluids, and of the action of the organs. I afterwards consider the body in its different mechanical relations, relatively to the nature of its functions; carefully avoiding a minute and disgusting display of anatomical erudition, that I may present to the reader essentials only, with some additional observations, equally solid and interesting. The description of the animal machine and the explanation of its
mecha-

mechanism every where succeed each other, and I demonstrate in what manner this study conducts the intelligent observer to the solution of many curious problems.

As the anatomist must lay the platform of one part of this edifice, the metaphysician must erect the other. From the examination of the structure of the body, therefore, I proceed to enquire into the nature of the soul. First, I consider its different powers, and then trace its progress in the unfolding and exercise of them. I enter into none of those subtil and ridiculous metaphysical disquisitions, in which so many writers have wasted their time and labour; I offer none but solid observations, and such as are susceptible of an equal degree of evidence with the most unquestioned physical truths.

After we have considered the soul and the body independently of each other, we must consider the two substances as united, and examine their relations, to be able to solve the wonderful phenomena arising from their reciprocal influence. I therefore consider Man in this view: but as it has often happened, that authors have
com-

composed long and grave dissertations on the causes of effects which never existed. I begin with establishing facts. Besides, as the great number of groundless opinions and erroneous systems have rendered truth itself suspected, when not founded on clear and evident facts, I reason only from constant and repeated observations; from observations universally admitted and easily ascertained, and such as establish my system on the firmest foundation.

Nothing but a series of accurate and uniform observations can give solidity to any system. It is only by studying nature, and by penetrating into its most secret recesses, that we can attain to the discovery of its arcana. It is only by aids drawn from observation, that we can receive that light, which must direct us amidst this darkness. It is not therefore by a vague and arbitrary hypothesis, that we can hope to discover the secret causes of the influence of the soul on the body, and of the body on the soul. It is by an attentive examination of the phenomena; by comparing a great number of analogous cases,

cases, and deducing from them some common property, which may be considered as their general cause and first principle. Thus, after collecting a sufficient number of facts, I consider them in all their different aspects, account for every phenomenon from known physical laws, and by an attentive examination of them, attempt to draw sufficient light to discover the principles of the reciprocal influence of these two distinct substances, and the natural explanation of their relations: that is, I endeavour to replace in the class of simple effects, those phenomena, which have occasioned such wonder amongst philosophers.

But that my work may form a well connected whole, and that all its parts may serve to the elucidation of each other, it will be proper to place the reflexions of which it is composed in proper order.

I therefore first consider Man in general and in the abstract; then relatively to other animals; and afterwards to himself, following him gradually through every age, from the instant of his birth, to the final period of his existence. I consider him
after-

xxviii P R E F A C E.

afterwards relatively to the difference of sex, temperament and constitution; and lastly, relatively to the soil, climate and condition. One word more and I have done.

As, from the nature of my subject, I must treat of many different matters, all of these could not possibly be comprehended in one continued treatise, or be presented under one single point of view, I must take leave to warn my readers, that they may expect to meet with many interruptions; the thread of the work will be broken off by the multiplicity of objects, and by the nature of the facts which may require to be spoken to. On the other hand, being under a necessity to keep the leading points ever in sight, I must be attentive at the same time to every particular phenomenon as it occurs, so as not to let even the most minute escape me, since on these the connexion of the more important parts very often depends: the repetitions to be met with are to be accounted for from the same causes.

The plan of my work is too comprehensive for me to presume I have explained

ed every relation. On the contrary, I am convinced that many things have escaped me: the subject is too copious, and gives rise to such an endless variety of ideas and reflexions, that it was frequently with difficulty I could keep sight of the main scope of my design, so far from being able to exhaust the subject. The great and most important question is, whether I have well examined the things which belong to my subject amidst so many perplexing ideas. The reader is the proper person to judge of that. I am sensible I may have been mistaken in many respects; what Man, who considers as he ought the uncertainty of human knowledge, can be so vain, as to think himself secure from error?

If I have failed in my aim, I may be at least permitted to indulge the hope, that my labour will not be entirely thrown away; that I have thrown some light on many phenomena, which before were involved in obscurity; removed many difficulties; launched into an ocean entirely unknown; forewarned others of the rocks on which myself was wrecked, and
opened

opened a tract, by which others may here-
after proceed. If I have thus far suc-
ceeded, my part is performed, and (be it
spoken without arrogance) I may say with
Tasso,

Racciatrai la sua parte
The great and most
important question is whether I have well
examined the things which belong to my
subject amidst to many perplexing ideas.
The reader is the proper person to judge
of that. I am sensible I may have been
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difficulties; launched into an ocean of
truly unknown; forsworn others of the
rocks on which myself was wrecked, and
opened

INTRODUCTION.

FROM the vast system of beings, which nature offers to the consideration of a philosopher, let us select Man, an animal, of which so much has been written and hitherto so little understood. What Subject can be more interesting, or more worthy of our enquiries?

Let us survey the whole scene of Man, observe what offers to the slightest observation, as well as that which is more intimately concealed. Let us follow the rapid movements and perpetual variations of the soul, point out the diversity of minds and the lineaments which characterize them, display the hidden principles of character, and the secret sources of genius and of the passions. Let us remove the veil which conceals them from our sight, and explain why one Man differs from another, and each Man so frequently from himself; let us enquire what Man is.

Man, considered as an individual, is not the object of the present enquiry; but Man in general, of all countries, of all climates,

ii INTRODUCTION.

mates, and of every age ; an immense undertaking ; a profound abyss for the mind to attempt to fathom ! Yet such is the importance of the enquiry, that I shall not believe my labour wholly lost, should my success hold any proportion to the dignity of my subject.

But from what data shall we reason upon Man ? How discover the affinity between the substances which form his being, and the causes of their wonderful influence on each other, without being first acquainted with the substances themselves ? And how are we to gain this acquaintance, but by considering their effects ? Let us then examine these effects ; endeavour to analyse Man, and resolve him into his original elements of body and spirit ; consider their properties and functions, and view the order observable in the mechanism of the one, and in the exercise of the faculties of the other.

BOOK

OF THE NERVOUS FLUID.

Of the connection of the nervous parts. 31

Particular observations on the influx of the nervous fluid into the organs of motion. 32

CONTENTS.

PREFACE,	—	page
INTRODUCTION,	—	—

BOOK I.

Of the human body,	—	33
Of the solids,	—	35
Of the fluids,	—	37

SECTION I.

Of the body, considered as the general organ of sense and motion,	—	38
Of the seat of the soul,	—	47
Of the structure of the nerves,	—	51
Of the union of the soul and body,	—	57
Further observations on the origin and structure of the nerves,	—	58
In what manner the soul acts on the fluid of the nerves, and the fluid of the nerves on the soul,	—	59
Of the nervous fluid,	—	63

New

ii C O N T E N T S.

New observations on the structure of the
nerves, — p. 69

Of the connection of the nervous parts, 71

Particular observations on the influx of the
nervous fluid into the organs of motion, 80

Necessity of the arterial blood to motion, 83

Of the organic elasticity of the fibres, 103

Of the organs of motion, considered rela-
tively to their different degrees of pri-
mitive elasticity, 104

Of the different degrees of the organic elas-
ticity of the fibres, 111

The organs of sense considered, with regard
to their different degrees of sensibility, 119

B. O. O. K. II.

A treatise on the human soul, — 126

Of the faculties of the soul, — 130

Of innate sentiments, — 138

A refutation of the opinion of philosophers
concerning pity, — 141

Of sensibility, — 147

Of the instinct, — 148

Of the understanding, — 148

Of the effects of the passions on the
understanding, — 149

C O N T E N T S.

Of the formation of our ideas,	P. 152
Of memory,	155
Of remembrance and recollection,	158
Of the will,	163
Origin of the different sentiments of the	
soul,	164
Of the passions in particular,	173
Refutation of a sophism of <i>Helvetius</i> ,	177
Of the comparative force of the passions of	
the senses and mind,	183
Of the unfolding of the powers of the soul,	185
Of the exercise of the powers of the soul,	190
Of the exercise of sensibility,	194
Of the exercise of the understanding,	201
Natural succession of the thoughts,	210
In what manner thought becomes reason or	
imagination,	202
Farther observations on the exercise of the	
understanding,	214
Of wisdom and madness,	214
Of regular thought, considered relatively	
to the degree of attention it requires,	216
Of penetration, stupidity, sagacity, and	
dulness,	220
Some singular phenomena explained, con-	
cerning the effects of the passions on the	
understanding,	223

iv CONTENTS.

Of the exercise of the memory,	p. 238
The exercise of the will, — —	242
Particular observations on the sensations,	244
Of the force of the passions, —	248
Of the combination of the passions —	253
The duration of the passions, —	256
Of the life of the soul, — —	259
Aburd opinion of philosophers on the force of the soul, — — —	261
Right judgment of the force of the soul,	264
Of the feigned force of the soul. —	269

BOOK I.
OF THE
HUMAN BODY.

MAN, in common with all animals, is composed of two distinct parts, soul and body *, the body being the first of these which presents itself in Man, and the only one whereof our senses give us any distinct idea, shall be the first object of consideration.

But first let me contract so extensive a subject, and endeavour to reduce it within its proper limits.

I shall not consider in this work, those properties of the body which it possesses in common with matter in general, such as extension, solidity, gravity; nor, in short, any thing which does not belong to it as an organized machine.

Neither is it necessary for me to undertake the anatomical description of the parts

* I shall not stay here to prove so established a truth; should any of my readers entertain the least doubt, he may dispense with reading my work: it is not for such I write.

VOL. I.

C

which

34 OF THE HUMAN BODY.

which compose this machine. To give an exact description of them, is a task I shall leave to anatomists.

The design I here propose to myself, is to consider the mechanism of the human body in some general points of view, and chiefly with respect to comparative anatomy; I confine myself to such descriptions only of this machine, as are necessary to give a proper knowledge of its functions, and to enable me to convey my ideas with order and precision.

The material part of Man forms an admirable machine on hydraulic principles; we discover therein innumerable channels with fluids of various kinds, and particularly one principal fluid which gives motion to the whole. I shall omit the prolix observations of anatomists, and the calculations of *Verdriers* of the prodigious number of our vessels: I shall only observe, that both the eye and the microscope convince us, that the human body is entirely composed of vessels, of liquors contained in those vessels, and of membranes to which they adhere.

Both

Both vessels and membranes are termed *solids*; all the other parts are classed among the *fluids*.

Of the SOLIDS.

The solid parts of the human body are all composed of an homogeneous substance, of a gelatinous juice, or rather of the solid parts of this juice, more or less separated from the fluid, and intimately combined one with another.

In analysing the organic parts of the animal machine, the deepest researches have succeeded no farther than the discovery of a simple fibre; and of this we judge more from the imagination than from the sight.

From the most attentive examination of the carnos substance of the body, the most simple fibres which the microscope can discover appear hollow, and the elementary parts of these fibres, we may easily perceive, are composed of other small fibres which have no cavity, much resembling a filament of silk, which is composed of many smaller filaments; and this fibre without a cavity is what we call a *simple fibre*, see fig. 1, and must be con-

36 OF THE HUMAN BODY.

dered as the organized principle of all the solids, since it is the farthest boundary to which our researches can possibly attain.

From this idea of the construction of fibres, it will be no difficult task to discover their properties; they will be lax and flexible, if too much moistened with lymph, or if their elementary capillaments are not closely enough united; on the contrary, they will be stiff and rigid if the lymph be too sparingly supplied, and if their constituent parts are too firmly combined. The solid parts of the animal machine differ one from another by their texture, according as it is more or less compact; upon this difference depends that of their *primitive elasticity*.

Simple fibres united in a parallel direction, and fashioned into a cylinder, form a small tube, which we term *an organic fibre*, or *fibrilla*. See fig. 11.

Many organic fibres united compose a *muscular fibre*, see fig. 111, and of these organic and muscular fibres are formed membranes, vessels, the carnos substance of the body, the bones, muscles, and the whole texture of the solids.

Of

Fig. 1.

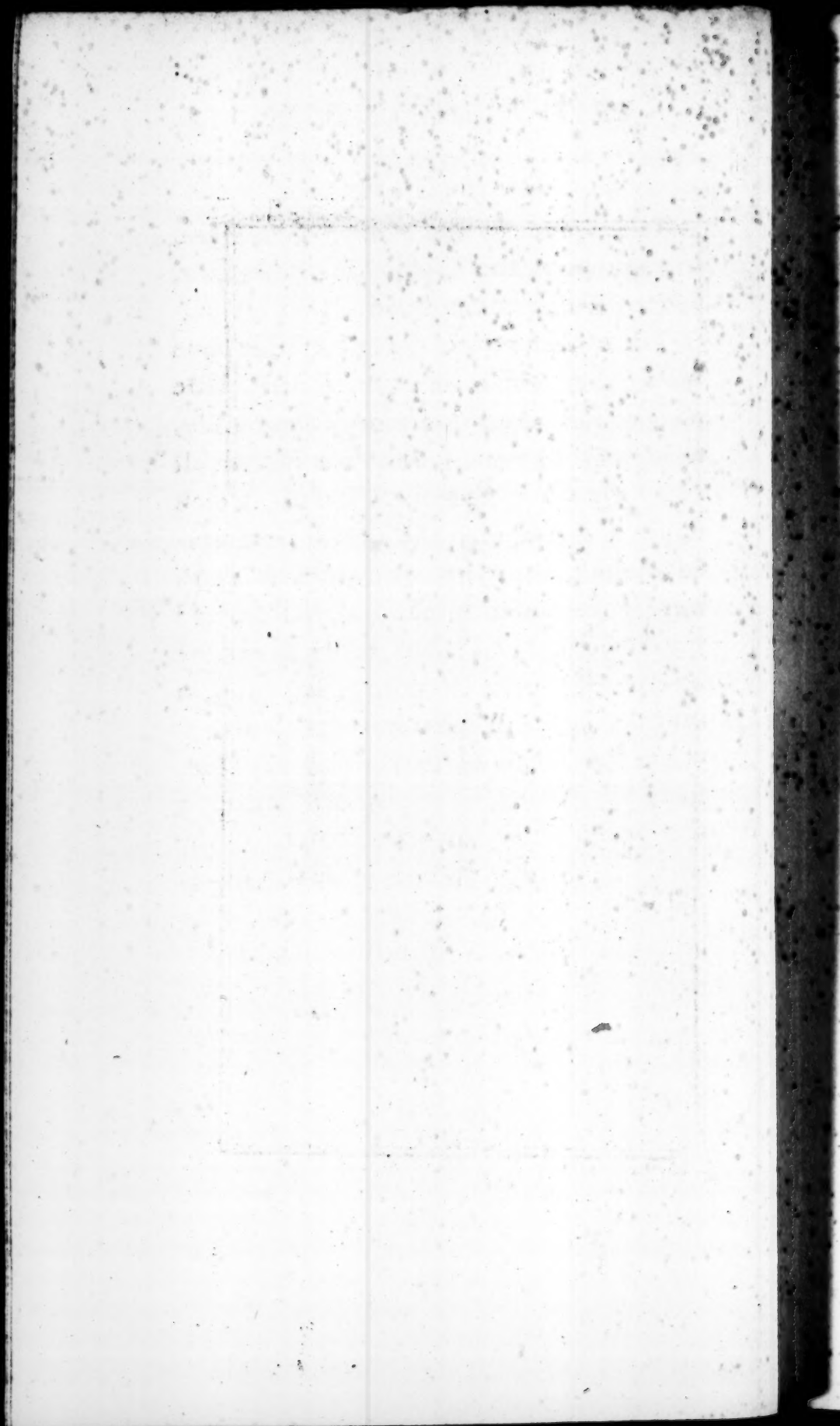


Fig. 2.



Fig. 3.





Of the FLUIDS.

The liquors of the human body have, in common with all other fluids, fluidity, and a peculiar composition.

These liquors are not all of the same kind; they differ in colour, smell, taste and consistence: examined chymically, they vary likewise; they are indeed all composed of an aqueous principle, which serves as a vehicle to the globules contained therein, the basis of which is earth impregnated with sulphurous, saline, and spirituous particles: but these are more or less subtiler in some, more or less gross in others, and in all differently combined.

Of the fluids of the animal machine, some are formed, in the animal itself, of the juices which are extracted from the aliments, either crushed or dissolved, as the chyle, the blood, the bile, &c. the others come already formed from without, as the ætherial fluid, the air, &c.

SECTION I.

*Of the Body, considered as the general Organ
of SENSE and MOTION.*

ALthough the body is composed of so many different machines, and although each of these machines has its particular functions, yet these different functions are performed upon these two principles only, viz. *Sense and Motion*.

The motion of the heart and vessels, is the cause of the circulation of our fluids; the motion of the jaws divides the aliments; the irritation of the salival and stomachic glands, occasioned by the attrition and stimulus of the aliments pressing them to discharge their liquors, when set in motion by the internal heat, performs digestion. By motion external objects act on the body, and by the senses we receive their impressions: finally, by motion and sense, we perform both those actions which are voluntary, and those which appear to be mechanical. Examine the functions of our organs, all the phenomena of the animal œconomy, and you will not find one which has not for its cause

cause either the one or the other of these principles, or the two principles united.

If we enquire into the origin of this principle in a living animal, we shall observe, that of all the parts of the body, the nerves only, and the nervous productions, are the seat and organs of motion, as may be proved by a great number of experiments.

Extrenal objects act on our bodies; we feel this impression in that part on which they act, and the soul is conscious of this impression.

We can extend and move our limbs at pleasure; if I would extend my arm, in an instant my arm is extended, here the soul commands and the body obeys.

If you fix a tight ligature on a nerve at its insertion into a muscle or on any part higher, immediately the muscle loses its motion. If you force the point of a lancet into this muscle, which will be now paralytic, it immediately contracts, but the soul is not conscious of this impression; when the nerve is divided, you will observe the same effect.

Puncture the heart of a living animal, and you will find the heart to contract;

40 OF THE HUMAN BODY.

separate this heart from the body, again puncture it, and you will find it again to contract; however frequently you may repeat this experiment, the same phenomenon will ensue: proceed further; divide the heart into many pieces, puncture every one apart, and in each the same effect will be seen. Take any animal you please, the same effects will always follow the same experiments.

If you cut the body of a viper into many pieces, you will perceive every part to be contorted and moving like so many distinct animals; whilst the head will be reverted, and will attack its hinder parts with its teeth.

During a battle, limbs separated from the body are frequently perceived palpitating on the ground.

Thus the principle, which causes the construction of the heart and the motion of the limbs, subsists for a while after they are separated from the body.

From these experiments, frequently repeated and constantly attended with the same event, it follows,

First, that the soul is not the immediate mover of the body,

Se.

OF THE HUMAN BODY. 41

Secondly, that the soul does not feel in every part, nor is it diffused through the whole body.

Thirdly, that sensation is performed by the nervous fibres upon which objects act.

Fourthly, that sensations are communicated to the soul by the nerves. The body is therefore sensible of itself independently of the soul, since irritability is a property of nervous fibres: in this case, the reality confirms the appearance.

But object not, as some philosophers have done, that the soul is often confounded with the body, from whence it happens, that the soul imputes its peculiar sensations to the body, and believes that it is the body, when it is the soul only which feels; thus the soul imagines that the ear hears, the eye sees, and the finger suffers the pain of a puncture, which is felt only by itself. Neither say with a celebrated modern physiologist*. “That
“an immaterial substance occupies no
“space, that it cannot be said the soul
“can be in two or more places at one and
“the same time, although by its influence

* Le Cat, in his Treatise on Muscular Motion, page 306, Berlin 1765.

42 OF THE HUMAN BODY.

“ it act in several places at the same in-
“ stant; that it acts there by its influ-
“ ence only, but not physically like a ma-
“ terial substance, since the soul is not
“ material; that if the action and influ-
“ ence of the soul, exercised in several
“ parts at one time, prove its divisibility;
“ it will not be at all necessary, in order
“ to establish that opinion, to cut an ani-
“ mal into many parts; that if you punc-
“ ture at the same time the hands, the
“ feet and the face of a living person, eve-
“ one of these organs will contract to
“ avoid the pain; that the heart, sepa-
“ rated from the body of an animal, and
“ the divided parts of an eel, are not more
“ distant one from another, than the parts
“ just mentioned are naturally distant in
“ Man.” What can these specious argu-
ments avail against direct facts?

“ The soul is not material, neither
“ does it occupy any place in the same
“ manner with a material substance.”
Be it so; but does it follow from thence,
that it has no determinate seat, whence it
extends its influence? Fix a tight liga-
ture on a nerve at its insertion into a
muscle, does it not render that muscle
paralytic,

paralytic, and cut off all communication of the soul with that organ? Does it not entirely destroy their connection? And is not whatever is acting in that part, as perfectly unknown to the soul, as if the part were itself removed to the greatest distance? If then the soul perceives not what is acting in any organ after the ligature is fixed on its nerve, is it to be supposed, it can perceive what is acting in the same organ after amputation.

Why then does the muscle contract itself upon any painful impression, after the ligature is made? It is because the substance of the nerves is really itself sensible. And besides is it not evident, that if the body be insensible, the soul must always command the body to receive the impressions of objects? And that without this command, objects would not produce any sensation in the soul, as the eye perceives not distant objects without the assistance of the telescope? If the nerves had no sense, how could they communicate to the soul any sensation which they themselves had not received? How could they affect it, so frequently as they do, in opposition to itself?

With

44 OF THE HUMAN BODY.

With regard to the motion and contraction of the organs, I well perceive that the soul, though simple in its substance, can at one and the same time influence many organs in the animal machine; but it cannot perform this without the assistance of the nerves, and that only, as I shall prove hereafter, when the substance of the nerves is sound, without compression, and without a solution of continuity, and when the fluid with which they are filled has free communication with its source. Can it do so when a nerve has been divided, and the influx of the fluid interrupted? Or in the limbs, which have been separated from the body, though yet palpitating with life, can the connexion still subsist? Is not every member when disunited an entire independent body? It is therefore idle to pretend to compare the conformity of the distance betwixt the divided parts of an eel, with that of the distinct parts of an human body, as equally influenced by the soul. Besides, how can we presume to assert, that the soul acts in each of these mutilated parts, without affirming at the same time that the soul may be divided?

Shall

Shall we say that every part so divided has a soul? This would be giving many souls to one animal; or if you would rather suppose that the body has no sensibility, it can then have but one soul, which was divided at the time when the limbs were separated from the body: what absurdities is this system composed of! Let it not be objected, that the sensitive plant contracts itself on being touched in the same manner with the nerves; neither ask if sensibility be a property of matter; of what use would the sense of feeling be to a being which has none of the other senses? I would answer, That is entirely unknown to me; but what can you infer from thence? That there is something superfluous in the works of the Creator? Are you acquainted with all the laws of nature, thus daringly to determine on its works? Nevertheless when I have yielded you this, what conclusion can you draw from this, against the sensibility of the nerves?

There are cases where contraction is not the effect of sensibility, but of some mechanical cause, such as the contraction of a string of catgut, parchment, or green wood, exposed to the heat; the elastic fluid,

46 OF THE HUMAN BODY.

fluid, which is contained within their substance, being disengaged by the action of the fire, escapes, and in escaping, agitates the body in which it was contained. The case may be the same, where the contraction following a puncture, is the consequence of laws purely physical, and not the effect of sensibility. It may likewise be the case of the sensitive plant, but this is a problem no one is able to resolve. The question, which regards this plant, will remain for ever undecided : as the plant is not animated, sensation may be so produced, as to preclude all means of discovery.

In animal bodies, the contraction which immediately follows any painful impression, is certainly the effect of sensibility, as is proved by the identity of the phenomena in the amputated parts of the body, and in the body before amputation.

Hence the denying sensibility to the body*, and giving it entirely to the soul, is to oppose evidence itself.

Of

* But are our nerves endued with sensibility, as being composed of sensible parts, which parts are formed of very minute sensible particles? Or is not sensibility a quality which results from their particular arrangement?

Of the Seat of the Soul.

The seat of the soul naturally presents itself here for our determination.

The reader, astonished that the soul feels not in every part of the body, will doubtless enquire where the seat of the soul is. This question must be answered by facts.

We

ment? Who is assured of this? Yet, to judge by our imperfect conception of the grounds of things, we would be apt to believe, that the elements of the body are not endued with sensibility; they are perfectly solid, and consequently incapable of any disarrangement of parts, without which external objects cannot make any impression on the senses. Besides, all bodies are composed of similar elements, and of principles which are common to all, only differently arranged; the principles of which nerves are formed, are similar to those of which leaves, flowers, fruits, and plants are composed; hence sensibility probably belongs to matter, as a property dependent on its organization. Moreover, sensibility extends itself to every part of the body, in the same manner as life, and animates these parts no longer than while the fluid of the nerves remains, (see the experiments hereafter mentioned) and while the combinations of the organs continue unchanged. But who can admit these reasons as demonstrative? Who has so little observed nature, as to undertake to explain the whole by the small number of its known laws, and to think there is sought but uniformity in the universe.

48 OF THE HUMAN BODY.

We know that the membranes which supply a coat to the spinal marrow, are a continuation of the meninges, and that they give rise to all the nerves of the lower parts. In all animals, a transverse section of the *medulla spinalis*, is immediately followed by a paralytic affection of all the parts situated below that section; after which, the soul receives not any sensation from these parts.

Luxations, whereby the spinal marrow is compressed, are attended with the same effects.

If you divide the membranous productions of the brain, or that part whence they send off a coat to the *medulla oblongata*, or even fix a tight ligature thereon, the whole body of the animal is instantly without motion, and the soul is deprived of sensation, the head only giving some faint signs of life. This is evident in the *Tetanos*, a disease somewhat uncommon, produced by a violent contraction of this part. In the palsy, a disorder so frequent and so dreadful, life is gradually extinguished, the limbs successively lose their motion, the extremities become insensible, death steals on the trunk, marking
ing

ing his course on every part he passes over until scarce any signs of life are perceived, and these in the head only.

If these observations do not precisely mark out the seat of the soul, they show at least that we are to look for it no where but in the head. To these proofs let us add our own feelings; every one who thinks intently, perceives a kind of tension within his head, and that his ideas are formed within that organ.

Anatomists agree, that we must look for the seat of the soul in the head; but they are not unanimous what place it occupies in that part of the body. Some place it in the *pineal gland*, others in the *corpus callosum*, others again in the *cerebrum*; some in the *cerebellum*, and some in the *meninges*. But of these different opinions, the last only is well founded; for, if we trace the nerves to their entrance into the membranes of the brain, we shall find they confound themselves with the *meninges*, and form one simple uniform substance with them. Hence if the nerves only are sensible, and if the sensations are not continued to the soul but by these organs, we plainly perceive, that the me-

50 OF THE HUMAN BODY.

ninges must be esteemed the seat of the soul. For as these membranes and their productions are the general organs of sensation, and as the soul is at the concurrence of all the sensations of the body, its seat must be in that part where this concurrence appears, viz. at the centre of all the organs of sensation; these membranes are this centre. Experience likewise daily confirms it; the slightest inflammation of the meninges occasions a delirium, and a temporary insanity. The irritation of the nerves, by the fumes of wine from drinking to excess, or by the fumes of tobacco, is followed by the irritation of the meninges and loss of reason; this never happens to any other part of the head.

The substance of the cerebrum and cerebellum, may be taken from a living animal, without the soul's being instantly affected; and though the wounds of the centre of the brain, of the pineal gland, and of the corpus callosum, sometimes injure the functions of the soul, it is not because the seat of the mind is in either of these parts; but because these parts secrete a fluid which is necessary to its operations, and by reason of the irritation which wounds

wounds in these parts communicate to the meninges.

In these membranes eternal wisdom has placed the soul, and united it to our organs by imperceptible bands; here it has fixed the seat of thought, of memory, and of the will.

More accurate observations may hereafter fix precisely the seat of the soul in these parts, and determine that *sensorium commune*, which has occasioned so much dissension among philosophers, and of which they have hitherto formed ideas so erroneous and absurd.

Of the Structure of the NERVES.

We know the nerves to be a continuation of those membranes, which supply a coat to the spinal marrow; the fluid which is contained in their trunk will then circulate through their ramifications.

Examine in a living animal the thickest part of a nerve after its diametrical section, or where there is a solution of continuity by an ulcer, and you will find a whitish liquor to issue from it, of the colour and
D 2 consist-

52 OF THE HUMAN BODY.

consistence of the white of an egg*, Here the existence of that very fluid, which was established by the necessity of facts, is proved by ocular demonstration. Hence the nerves appear to be real tubes, although their internal substance seem entirely compact, so that, though assisted by the best glasses, we cannot perceive the least cavity.

We must therefore distinguish in the nerves two things, which are common to all other vessels in the animal machine, viz. the substance of the nerve itself, and the fluid which circulates within it.

The substance only is sensible; the medulla of the brain has been proved to be void of sensibility, even in the cerebrum itself. The Memoirs of the Academy of Surgery at Paris contain many observations on foreign bodies, such as musket balls, pieces of iron, heads of arrows, points

* Some accidental causes may prevent the efflux of this liquor immediately after the division of a nerve in a living animal, such as that contraction of the fibres, which ever accompanies any painful sensation: but it is only in living animals that we can discern this efflux; in a dead animal this fluid is coagulated and fixed in the rigid vessels, as is its blood in the veins.

points of swords, splinters of the cranium, contained for many years in the substance of the brain, some of which had never been discharged; and this without occasioning the least injury to the persons in whose brains they were found. But there are proofs yet more convincing. Open the brain of a living animal, just at the section of the meninges, the animal will suffer extreme agony, and vent the most doleful cries; keep the lips of the wound open, and when its cries remit, thrust the point of any instrument a good way into the substance of the brain, the animal will still be silent and not give the least sign of any painful sensation.

The medulla of the brain is then insensible; so is the nervous fluid. The experiments of *Mariotte* prove, that the light, which directly acts on that fluid at the extremity of the optic nerve, makes no impression thereon; and that, to communicate its impression to that fluid, is required the mediation of a solid membrane. The experiments of *Mery* prove the same with respect to the retina, which is an expansion of the medulla of the optic nerve.

54 OF THE HUMAN BODY.

Therefore the solid part only of the nerve is sensible; but in what manner do the nerves communicate their sensations to the soul? Is it by the substance of the nerves, or by the fluid which circulates within them? An answer to this question is likewise to be deduced from facts.

We have seen in the foregoing experiments, that after a ligature is fixed on a nerve, the soul is not conscious of any impression of objects on the muscle, into which this nerve is inserted; the ligature then has cut off its communication with the soul. That interception is not occasioned by the simple ligature, but by interrupting the action of its fluid: otherwise the impression, which an object has made on one part of a nerve, would be continued by its substance, as the motion which is communicated to one end of a cord, which is strained and tied in many parts, will extend, notwithstanding the tying, to the other extremity; the ligature not having occasioned a solution of continuity. I could likewise, if necessary, oppose to those writers who attribute this communication to the substance of the nerve, and who pretend, that the sensations
are

are communicated to the soul by the tremor of the nervous fibres, by an uninterrupted continuity of a vibrating nerve, that the nerves are sometimes relaxed; that they make many circumvolutions in their various branches, that their principles are to their productions, or their trunks to their branches*, as one to many thousands; in fine, that most of the nerves terminate in ganglions, and that the greater part take their rise from them, and not immediately from the covering of the brain. Thus the impressions of objects, communicated to the nerves, cannot be propagated by their substance: for how can the nerves, which never reach the brain, carry the impression of objects to the *sensorium commune*? The sensations must therefore be produced by the coats of the nerves, and be communicated to the soul by the nervous fluid.

But how can an insensible substance communicate a sensation, of which it is

* From a ganglion, which takes its rise from a single nerve, frequently spring about an hundred other nerves nearly of the same magnitude, and from this hundred near a thousand more.

56 OF THE HUMAN BODY.

not at all susceptible in itself. This question I confess myself unable to answer; neither is it related to my present subject.

We have seen that the tying a nerve, somewhat above its insertion into a muscle, is followed by a paralytic affection of that muscle; but if you press that nerve with your fingers, gradually moving them from the ligature towards its insertion, you will immediately perceive the muscle to contract and recover its motion. This can only be occasioned by the fluid contained in the nerve, and determined towards the muscle by this compression: hence it appears, that the motions of the muscles depends on their being connected with the brain by the nerves.

From what has been said it is conclusive, that the sensations are communicated to the soul by the nervous fluid. Hence this fluid acts immediately on the soul. And since the nervous fluid is the immediate principle of motion to the body, the soul acts directly on this fluid in all voluntary motions.

Thus it is by the nervous fluid, that these two different substances communicate with each other.

Of the Union of the Soul and Body.

But after what manner can a material substance act on an immaterial? The judicious reader certainly expects not that I should assign a reason for a connexion impossible to explain; we are entirely ignorant of the essence of things; their relations are all we are permitted to know; this knowledge is the only object I have proposed to myself in this Treatise.

Here metaphysicians may exclaim. Is the soul then material, that matter can act upon it? Let us allow these men so arrogant, and yet so ignorant as to refuse their assent to every thing which they cannot comprehend, to shut their eyes against every thing above their capacity. More humble and more wise, let us acknowledge our own weakness, though still open to conviction and to truth, when accompanied with demonstrative evidence: even although it may seem incomprehensible, instead of endeavouring to overthrow the admirable laws of nature, with a view to bring down its arcana to a level with our narrow conceptions.

Farther

Farther Observations on the Origin and Structure of the NERVES.

The only part of the nerves which has solidity, is the coat they receive from the membranes of the brain: hence it appears, that those membranes of the brain compose the substance of the nerves: this is evident from the most accurate dissections.

Although all nerves take their origin from the meninges, like the rest of our solids, yet they take it not always immediately therefrom; for the origin of the nerves in the brain is extremely small, and on the contrary, their divisions are extremely large and numerous: besides, the nerves of the spine go not to the brain; and it has been proved, that a great number of nerves are originated from ganglions, and that the greater part of them terminate there likewise. Nor have all our nerves the same origin in the head; some are generated from the medullary substance of the * brain; others from the *medulla ob-*

* The six first pairs.

longata;

longata *; and others again from the spinal † marrow.

In regard of their structure, since these organs are composed of vessels, or rather of *fasciculi* of small fibres, every one of which is formed of many small tubes united under one common covering; this structure must follow the ordinary laws of that of the other vessels; that is, the substance of every small tube is composed of many other smaller tubes, which are formed of elementary fibres, or fibres without a cavity.

In what manner the Soul acts on the Fluid of the Nerves, and the Fluid of the Nerves on the Soul.

And here let us recal a very important observation.

We have seen that the fixing a tight ligature on a nerve, somewhat above its insertion into a muscle, renders that muscle paralytic: we have seen likewise, that if the nerve be pressed with the fingers, gradually moving them from the ligature to its insertion, the muscle immediately contracts and recovers its motion.

* The seventh, eighth, and ninth pairs.

† The three first pairs called cervicales.

This

60 OF THE HUMAN BODY.

This observation determines the manner of the soul's action on the fluid of the nerves : and hence it appears, that its action on this fluid is an impulsive motion towards the organ it wills to contract. The impossibility of repelling the fluid, with which the nerve is replete, towards the ligature *, without repelling at the same time a part towards the muscle, deprives us of the means of proving this by the opposite experiment. But an observation easy to be made, and which is nearly equivalent to this experiment, is, that the quantity of the fluid which, in this latter instance, is determined towards the muscle, is less than in the former; the contraction must therefore be weaker, as experience fully confirms. *Le Cat*, who had not made this observation, was astonished on compressing the nerve, gradually moving the pressure from the muscle to the ligature, to find the muscle contract. Deceived thereby, he strenuously asserted, that it was not by the influx of the nervous fluid into the muscle, that that organ recovered its motion, and gave

* That is, towards the part between the fingers and the muscle.

the experiment to support his assertion. But the same thing happened in this experiment, as in many others, viz. appearances concealed truth from the eyes of the undiscerning spectator.

With regard to the manner in which the sensations are continued to the soul, it is evident to me, that this must be occasioned by the reflux of that fluid to the *sensorium commune*. But this is impossible, says the physiologist*, just cited: “ For the
 “ spirits are impelled incessantly to every
 “ part by the motion of the meninges, as
 “ the arterial blood is impelled by the
 “ heart towards the same membranes.
 “ How can it be imagined, that a straw,
 “ which tickles the sole of the foot, can
 “ repel the nervous fluid to the brain,
 “ since there is no impression sufficient to
 “ repel the least drop of blood from the
 “ feet to the heart? If this reflux were
 “ the cause of these sensations, the plac-
 “ ing the palm of the hand upon any
 “ part of the body, would excite a much
 “ greater reflux, and consequently a much
 “ stronger sensation, than would be felt

* Treatise of the Sensations and the Passions, vol. 1. page 186. Paris 1767.

“ from

62 OF THE HUMAN BODY.

“from forcing a pointed instrument into
“the part, which nevertheless produces
“a much more pungent sensation.”

We shall perceive how weak this objection is, if we consider but for a moment, how exceedingly gentle the motion of the meninges is, which determines the nervous fluid into the nerves, when compared with the motion of the heart, which impels the blood into the arteries, particularly if we only observe, that the nerves have no valves like the blood vessels, to prevent the reflux of their fluid; above all if we observe, that our author is unacquainted with the cause of the reflux of this fluid, and that he confounds the force of this reflux with the quantity of the fluid in motion. For it is not the action of an external object, as a compressing cause, but as an irritating one, which occasions the nervous fluid to flow back. By irritating the nervous fibres, it obliges them to contract and to impel the fluid, which is now compressed in their contracted channels, with so much the more force as the irritation is greater. Now as that contraction begins always in the part affected, so the nervous fluid is always necessarily

cessarily determined towards the origin of the nerves. How simple this mechanism! How perfectly concordant with its phenomena! And how completely it removes such objections!

Although the sensations be communicated to the soul by the reflux of the nervous fluid, it does not follow from thence, that the portion of this fluid, which is contained in the organ immediately affected, continues its reflux quite to the soul. This communication is effected by the continuity of the column of the nervous fluid: that part therefore of this column, which is surrounded by nervous fibres, which are immediately affected, is the medium of communication with the other parts, and so on towards the brain, by their reciprocal and instantaneous pressure.

Of the NERVOUS FLUID.

I have proved, that the nervous fluid is the band which unites the soul and the body: the existence of this fluid is evident: but what is its nature? To discover this, let us consider its effects; beginning with a short examination of the organs by which it is prepared.

The

64 OF THE HUMAN BODY.

The *cerebrum* is the filtre of this fluid, and the *cerebellum* its reservoir. The *cerebrum* has all the characters of an organ of secretion; its cortical substance is formed of an infinite number of very minute glands, which are found in all organs of that kind; its medullary part is composed of small fibres, whose direction may be easily perceived, although their cavity be undiscoverable by the best glasses: the particles which form that fluid are carried into the filtre by the carotid and vertebral arteries. Thus the nervous liquor is secreted from our other fluids: but what do our fluids supply to the brain for the production of this subtil liquor? Or rather, what is this liquor itself? It is only by considering its effects, as I have already said, that we can discover its nature; let us therefore examine its properties.

The nervous fluid serves both to the motion of our organs, and to the nourishment of the nerves: I shall examine it in these two points of view.

The nerves receive an increase proportioned to that of the other parts of the body; and, their substance not being penetrated by any foreign organ, they take
their

their increase from the fluid which circulates within them: this fluid must therefore be analogous to the substance of the nerve, and is, in fact, a nervous jelly, since all the nervous productions are resolvable into a liquor of this kind.

This gelatinous liquor is very observable in the internal part of the brain and its ventricles; it may be seen oozing from ulcerated nerves; it may also be distinguished in that tumor, which is formed by the nervous fluid extravasated from its natural vessels, known by the name of the *hernia spinalis*: it is particularly observable in the semen; in a word, all our fluids are visibly supplied with this gelatinous lymph.

But the nervous fluid is not simply the principle of nourishment to the nerves, it is likewise the source of strength to the whole body: the animal, in which this fluid abounds, is distinguished for its uncommon strength; its loss occasions languour and dejection. Can this quality then be the cause of both these effects? To determine the question, I shall endeavour to reason from facts.

A considerable loss of this fluid, affects us with languour and dejection; it is scarce

66 OF THE HUMAN BODY.

extravasated from its vessels, when the body no longer retains its vigor, the limbs are without strength, and the organs in a general stupor. By supposing this fluid to be no other than the nervous lymph, we might easily conceive how any considerable loss of it would, in length of time, render the motions languid; but why is it followed by instant depression, and by so astonishing a languor, since the nerves are not without nourishment? For the nervous fluid lost, was certainly intended to nourish the nerves for some space of time. It is therefore manifest, that if the weakness, which ensued on the loss of that fluid, was produced by a diminution of nutrition, by an atrophy of the nervous parts, it would have come on by degrees, and not instantaneously.

But let us penetrate yet farther, and endeavour to discover the nature of this fluid, from the manner of its preparation.

The nervous fluid is incessantly dissipating, it is exhausted by action and likewise by rest: for we perceive our strength to fail after fasting, though in a state of perfect inaction, in the same manner as after violent exercise.

When

OF THE HUMAN BODY. 67

When a person is under this languid depressed state, if you give him somewhat moderately spirituous to drink, he finds his strength immediately recruited and his vigour renewed: the draught therefore has restored to the nerves the principle they had lost. How should this be possible, if the nervous fluid be only a purely gelatinous juice; seeing we cannot extract one gelatinous particle from any spirituous liquor? Hence, besides this gelatinous juice, the fluid of the nerves is composed of a spirituous lymph: I say spirituous, because those aliments which abound with spirits, supply the body with this principle of life, and because a very small quantity of such aliments supplies more of it, than a very great quantity of food which is only slightly impregnated therewith*.

* A glass of any cordial wine gives more strength than ten times the same quantity of a decoction of oats or barley; it is however certain, that art cannot extract any gelatinous particles from this wine, nor is it certain that it contains any. On the other hand, it is evident, that a decoction of barley is strongly impregnated therewith, and that ten parts of this decoction produces two parts or more of purely gelatinous juice.

68 OF THE HUMAN BODY.

Should any one object, that these spirits will injure the nerves by acting on their internal substance, seeing they have that effect when applied outwardly ; I answer, that they act not directly on the nerves, and that they are sheathed by the nervous lymph, which serves as a vehicle to them. What confirms me in this opinion is, that there is no aliment throughout the vegetable or animal kingdoms, from which more or less of this spirituous fluid might not be extracted, and consequently supply the body with the principle of motion.

Let us hence conclude, that the fluid of the nerves is composed of a two-fold substance : of a spirituous and extremely subtil part, called *animal spirits* ; and of a gelatinous juice, distinguished by the name of the *nervous lymph*.

This gelatinous lymph, serves as a vehicle to the animal spirits, and being assimilated with the nerves, is transformed into their substance and becomes solid, like the viscous lymph of which the spider forms its web, when condensed by the compression of the air.

As it is evident that the nervous fluid is insensible, how can the nervous lymph, by
being

being assimilated into the substance of the nerves, become a sensible solid? I must leave this phenomena to be accounted for by those who may be willing to undertake the task.

With regard to the animal spirits, it is uncertain, whether a substance so subtil can be incorporated and become part of our solids. I incline to the negative, since no human art can fix it: it is moreover so volatile, that it could not be contained in any of our vessels, unless confined by some viscous fluid.

New Observations on the Structure of the
NERVES.

All the functions of the animal œconomy are founded upon unalterable and uniform laws; we may however sometimes observe phenomena in the human body, so very extraordinary, that they bear some resemblance to those singular appearances termed *lusus naturæ*.

We frequently see persons, who, after losing the use of their limbs, retain their sensibility*.

* This is often seen in paralytics.

70 OF THE HUMAN BODY.

We see others, whose bodies though become insensible, yet preserve their motion *.

Motion and sense therefore have their distinct principles in the same organ.

On inquiring into the reason of these phenomena, facts oblige us to attribute them either to two different fluids, or to the same fluid contained in different vessels of the same organ. But if we consider, that the nervous fluid has one common source, the same filtre and the same reservoir from whence it is impelled into the nervous fibres, we shall plainly perceive, that those phenomena have not different fluids for their origin, but the particular ducts of the same organ.

The nerves, as it is well known, are the organs of sense and motion: only the coats of their fibres are the organ †, and seat of sense independently of their cavity, whether we consider them as filled with

* The case of a Swiss soldier at Douây, who could perform his military exercise, but did not feel a large needle forced into the fleshy part of his body, up to its extremity.

† See a preceding section, on the structure of the nerves.

the

the medullary substance, as in the origin of the nerves, or with the nervous fluid, as in all the other parts of the body. Let us therefore conclude, that the cavity of the nervous fibres is the organ of motion; or, which is the same thing, that their ducts are the channels through which the fluid intended for action is conveyed.

Motion is then produced by the fluid which circulates through the cavity of the nervous tubes; and sensation by that which flows through the *fibrillæ* which compose the coat of these nervous tubes.

I shall therefore distinguish the same fluid into the moving *fluid* and the *sensitive fluid*; relatively to their different functions, and to the ducts of the nerves through which they circulate.

Of the Connection of the NERVOUS PARTS.

A violent blow on the head, though without fracturing the bones of the cranium, and without causing any solution of continuity in the texture of the solids, almost always occasions a total prostration of strength, convulsive motions of the limbs, nauseas, vomitings, sometimes a general disorder of all the functions of

the machine, and a total extinction of sense.

That simple commotion of the brain, and of the origin of the nerves, which is occasioned by the rowing of a ship at sea, commonly affects those, who are unaccustomed thereto, with vertigos, vomitings, anxiety, paleness, prostration of strength and languor of the whole body.

The *effluvia* of odoriferous bodies, as of musk, jasmine, and rose flowers, sometimes affect delicate women with suffocations, syncopes and faintings.

The corrosion of the smaller intestines by worms, frequently produces pains in the side, a cough, flux from the salival glands, dreadful cholics, vomitings, tremors, palpitation of the heart, convulsive motions of the whole body, a fever, dumbness, vertigos, the gutta serena, and the epilepsy, with its many dreadful symptoms.

What terrible disorders ensue from the bite of a viper, of a mad dog, or the application of a caustic body to an excoriated nerve! Paleness, nausea, vomitings, difficult respiration, cold sweats, convulsions, burning, and inflammatory fevers, retention of urine, syncopes, a spasmus

of the whole nervous system, and universal numbness are the usual concomitants.

Yet, when a sharp or pointed instrument wounds a nervous part, and occasions therein a solution of continuity, much worse effects will ensue. A simple puncture of a tendon by a needle, is followed with the most deplorable symptoms: there are many other observations, which may be made, of this kind.

All these alarming phenomena are produced by the irritability of the nervous system: the nerves we know are extremely sensible, they cannot endure the least irritation; so that when any thing affects them with a painful sensation, either by compressing, straining, wounding them and the like, immediately they contract and are convulsed. This contraction and convulsive motion are instantly communicated to the neighbouring parts, then to the next, and so successively to all the parts, till they comprehend the whole; from whence ensue a considerable disorder in the circulation, a very great distention and obstruction of the vessels, and a violent inflammation, with all the dreadful symptoms which accompany a disordered state

or

74 OF THE HUMAN BODY.

of the functions of the animal œconomy. This is a fresh proof, that all the phenomena of this œconomy have sense and motion for their origin, as has been already mentioned.

When we consider in what manner the irritation of one part is communicated to all the others, we are obliged, by the facts, to admit a reciprocal correspondency between them by the medium of the nerves; but the dissecting knife, and the microscope, make this connection evident to the sight.

I shall not here descant on the wonderful connexion between the nervous parts; I leave that task to those who are fond of the declamatory stile, and shall confine myself wholly to give a succinct idea of it. I beg pardon of my readers, for detaining them on a subject so dry as this must necessarily be; I know how much it is my interest to present none but agreeable subjects, and to set off philosophical enquiries with the embellishments of art; but this subject is connected with my work, and will admit of no foreign ornaments.

If we follow the nerves from their origin to their extremities, we shall observe
them

them to branch out into infinite ramifications in passing from the brain, and in their distributions to the different parts of the body, somewhat resembling the branches of a tree.

Here then we evidently see a double relation, subsisting, on one hand, between every part of the body and the membranes of the brain; and on the other, reciprocally between all the parts of the body. As it is not sufficient barely to mention these relations in the general, I shall offer an example of them.

Anatomists have distinguished the nerves, relatively to their origin, into different classes, which they have ranged under different denominations: I shall make use of the common terms, that I may render my work intelligible to my readers, these parts not being any otherwise distinguished.

The intercostal nerve is formed of three branches: the fifth, sixth, and eighth pairs, supply each a single branch.

The branch of the fifth pair sends out ramifications to the tongue, to the eye, to the jaws, to the cheek, and to the other parts of the face. The branch of the eighth pair, distributes some of its
ramifi-

76 OF THE HUMAN BODY.

ramifications to the tongue, to the pharinx, to the œsophagus, to the stomach and to the lungs. The intercostal nerve also communicates in the cavity of the thorax, and abdomen, with some other ramifications of the eighth pair, and is augmented with some branches which rise from the medulla spinalis, and pass between the ribs. Thus we perceive a very intimate connection betwixt all these parts: this is the reason why aliments, which are ungrateful to the taste, occasion a nausea and contraction of the œsophagus; why the touching of the root of the tongue with a feather, excites vomiting; and why wounds of the head, or a corrosion of the intestines by worms, occasion difficult respiration, vomiting, a cough, dumbness, and dreadful convulsions of the whole machine.

Besides the olfactory nerve, there enters into the nose a branch of the ophthalmic. The communication of these two nerves is the cause why strong smells excite tears, and a strong light occasions sneezing: the ophthalmic nerve being joined to the nerves of the thorax when violently affected, excites, in the organs of

respiration of the stomach: they have ma-

respiration, the convulsive motion, termed sneezing.

But this branch of the ophthalmic ends not at the organ of smelling, it is continued to the teguments of the *orbiculus nasi*, or tip of the nose, whence it is reverted to the internal surface of the septum. This branch arises from the fifth pair, as does the lingual maxillary: hence the reason why mustard applied to the tongue causes a pungent sensation at the tip of the nose, and excites a flux of tears. By this connection likewise, we may account for that titillation which is perceived in the nose, when the worms contained in the intestines, corrode and irritate the membranes of these viscera.

The nerves of the fifth and eighth pair, with the intercostal, supply the intestines and stomach: a branch of the fifth pair, as has been already observed, sends forth its ramifications to all the parts of the face: a branch of the eighth, sends forth part of its ramifications to the liver and biliar duct; whilst the intercostal supplies the legs with the *cuticula* and *posticum*. The intestines are a continuation of the coats of the stomach; they have ma-

78 OF THE HUMAN BODY.

ny nerves which are common to both, and by means of the mesenteric plexus, of the intercostal and the *par vagum*, communicate with all the membranes of the body. There is therefore an intimate connexion between these viscera, and all the other parts of the animal machine: hence dentition occasions vomitings, difficult respiration, suffocation, coughs, intestinal flux, fever, and universal convulsions. Hence, in the hypochondriac disease, the violent tension of the membranes of the stomach, occasioned by the inclosed air, produces pains in the head and shoulders, vomitings, vertigos, dimness of sight, languor, anxiety, palpitation of the heart, and a total disorder of the vital functions. Hence coldness of the feet, and hurts of the extremities, bring on violent cholics, and sometimes the *spasmus cynicus*. This is the reason why the irritation of the stomach by corrosive poisons, and of the intestines by worms, acrid bile, or drastic purges, is followed by a convulsive hiccough, difficult respiration, dumbness, coughs, palpitation of the heart, pains in the side, vomitings, flux of the saliva, violent pains in the intestines, paleness, coldness in the

extremi-

extremities, universal tremor, retention of urine, a tenesmus, hollowess of the eyes, contraction of the lips, mouth, and other parts of the face, spasms of the limbs, fever, vertigo, gutta serena, and many other dreadful symptoms.

I could enlarge upon this subject, but I fear I have already been too diffuse. Should any of my readers be desirous of more information, I recommend to him the perusal of the Neurology of *Vissusen's* and *Jenty*, where this subject is treated in its full extent: the observations I have made will suffice to establish the following proposition as a general law, which I shall make use of as I proceed; it is this.

All the parts of the body communicate with the membranes of the brain by the nerves, and with one another by common nervous ramifications.

Although all the parts of the body are connected with the membranes of the brain, that connection is not equal in every one. For seeing that the nerves are the productions of the meninges, and as their impressions are communicated by the motion of the nervous fluid, it is evident, that the more remote a nerve is from its origin,

80 OF THE HUMAN BODY.

origin, the less intimate that connexion must be: but supposing the distance to be the same, it is likewise evident, that the connexion of these two organs must be the more close, when they have a greater number of nerves common to both. In a word, as the nerves do not form an uniform cylindrical duct, from the trunk to the extremity of their ramifications, and as a great number rise from the ganglions, we may easily conceive, that the more a nerve shall form a continued whole, the greater will be the relation betwixt these organs. Thus there is no connection between the brain and the sanguineous viscera, the substance of which is purely vascular, such as the liver, spleen, &c. neither can any sensation pass to the *sensorium commune*, through their numerous circulations.

Particular Observations on the Influx of the nervous Fluid into the Organs of Motion.

When you cut off the head of most animals *, you perceive the limbs to move for

* Most persons have seen a duck, when its head has been separated from its body, run about for several minutes :

For some time after the amputation; however, these animals soon die; their bodies, when deprived of their heads, after a few efforts, lose their motion for ever. If this experiment proves the necessity of a connection of the muscular parts with the brain, it proves likewise, that this connection is not essential to every motion in particular. These motions therefore take place when there is not any instantaneous influx of the nervous fluid into the muscles. Hence it appears, that this fluid continues for some time in the organ of motion, and to act needs not any impulse immediately propagated from the brain. When once impelled into the muscular fibres, it follows the ordinary laws of circulation; it continues there a short time, and is then taken up by the lymphatics, or dissipated by perspiration.

The continuance of the nervous fluid, in the muscular fibres, is in proportion to the degree of viscosity of the nervous lymph. The more gelatinous that lymph is, a viper or snake will move a considerable time after decapitation; and flies, an entire day. Among all the animals, Man is that in which this phenomenon the least appears.

82 OF THE HUMAN BODY.

may be, the continuance will be the greater. Thus vipers, eels, snails and other animals, whose nervous lymph is extremely viscous and very little perspirable, are with difficulty destroyed. The case is not the same with animals of a sanguine and hot temperament, whose liquors are extremely fluid, circulation quick, and perspiration copious, as man, horses, dogs, &c. In these the nervous lymph is very soon dissipated, and there is a continual call for reparation. But in every species of these animals, the momentary independance, which is observed between the motions of the muscles, and the influx of the nervous fluid from the brain, does not prevent the cause, which intercepts this connexion, from totally suppressing these motions at their source.

It is different with regard to those animals, which have not any blood, and which have no brain, nor any organs of digestion, all whose liquors are nothing more than the nervous lymph itself, and that of a very glutinous consistence; such animals drawing their nourishment from the place to which they have been originally fixed, like

OF THE HUMAN BODY. 83

like the polypus and the oyster : besides, as no part of their bodies appears to want the assistance of the other, they can live after mutilation, and reproduce themselves ; so that from their very destruction they seem to derive the means by which they are perpetuated.

What I have just said of the influx of the nervous fluid must, however, be understood only of involuntary motion : since the seat of the soul is in the meninges, the soul has no power over the body, after the head is separated therefrom.

From the foregoing I infer, that if the observations here made prove the necessity of the connexion subsisting between the head and the trunk, it is because the head is the reservoir of the nervous fluid.

Necessity of the arterial BLOOD to MOTION.

The nerves are not the only parts necessary to the functions of the muscles : the arterial blood likewise contributes to their motion.

If the artery, which supplies a muscle with blood, be closely tied above its in-

84 OF THE HUMAN BODY.

sertion, that muscle will gradually * become paralytic; at first it will be numbed and stiff, and by degrees will be motionless. This experiment proves the necessity of the arterial blood to muscular motion, and of the connexion of the heart with the muscles by means of the arteries. The arterial blood is necessary to muscular motion as an immediate cause, but not as an instantaneous one; since the muscle, in the foregoing experiment, continues its motion many minutes after the influx of the blood is intercepted.

But how does the arterial blood conduce to the motion of the muscles? To me it appears to be done many ways.

We know that the cold air renders the fibres numb and stiff by fixing their fluid; this fluid therefore hath occasion for heat; and as the blood in circulation is the principle of natural heat, it is therefore certain, that the nervous lymph requires the circulation of our fluids, in order to preserve the fluidity necessary to the functions of our organs. The arterial blood therefore is assistant to muscular motion, as being the principle of heat. It is said, that the heat of

* In ten, fifteen, or twenty minutes, according as the animal may be possessed of blood, strength, &c.

fire does not restore motion to paralytic muscles. We are to observe, that the heat of fire is not a suitable substitute; the heat of the blood is dissolvent, and adapted to liquify the gelatinous lymph; the heat of fire is only calculated to dry it: therefore it is not at all strange, that the heat of fire, substituted in lieu of the heat of the blood, does not restore life to paralytic muscles. But supposing this to be a suitable substitute, what will thence follow, but that the arterial blood is not assistant to motion, merely as the principle of heat? Let us enquire then in what other manner it can be assistant thereto.

It is certain, that the nervous fluid is the principle of vigor and of strength to the body, that the *cerebrum* is its filtre, and the *cerebellum* its reservoir. It is certain, likewise, that some animals, like the mule and the ass, possess extreme strength, and endure fatigue for a considerable length of time; yet the *cerebrum* and *cerebellum* of these animals are very small, if compared to the same parts in Man, and in many other animals, which possess a much smaller degree of strength. Whence does this proceed, but from some

86 OF THE HUMAN BODY.

difference in the formation of the organs of motion, or in the liquors which supply the nervous fluid? To discover this dissimilitude, let us chuse, from among quadrupeds, that animal which nearest resembles a mule, as for instance, the horse; let them be of the same age, the same size, and, as far as it is possible, be both equal.

On comparing these two animals without dissection, we perceive at first sight a very great dissimilitude. The limbs of the mule are smaller than the limbs of the horse, the head longer, the legs smaller and of a greater length, and the sides less protuberant. On examining the internal parts, we find the muscles of the mule smaller than those of the horse, but its vascular system larger, the lungs of greater bulk, and the solids of a substance somewhat more compact. The cause of its greater strength, arises then principally from its having a greater supply of nervous lymph from the mass of its fluids. The blood of those animals supplies the nervous fibres with a greater quantity of this active fluid; this substitute is necessary in those large bodies, whose motions are considerable, and brain very small,
and

and consequently incapable of supplying any great quantity of it. This is the case of almost all quadrupeds; they have a large quantity of blood, large lungs, and an abundant supply of the nervous fluid. On the contrary, in all the animals which have only the gelatinous lymph, this substitute, which is extracted from the blood, and even the blood itself, is not any ways necessary; nor has nature supplied them with it.

Let us proceed yet farther, and endeavour to prove by ocular demonstration, what we have now been advancing on the testimony of facts.

We have said, that the nerves are the organs of motion; but the muscles are so in a more particular manner.

In a muscle we distinguish its body and its two extremities; the body of a muscle is entirely carnosus; one of the extremities, which is commonly termed the head of the muscle, is almost an entire fleshy substance; the other extremity, called its tail, is perfectly tendinous.

The body of the muscle is composed of many *fasciculi* of fibres, ranged in two different orders.

88 OF THE HUMAN BODY.

Each of these orders is enveloped with its peculiar membrane, and the entire muscle with a common coat, which combines the whole. Every one of these *fasciculi* is composed of muscular fibres, ten times smaller than the finest hair, as is observed by *Muys* and *Lewenhoeck*.

When examined by the microscope immediately after they are extracted from the body of a living animal, these fibres appear to be formed of vesicles, and resemble a tube full of a limpid liquor, alternately composed of globules of liquor, and globules of air. See fig. 1.

After these globules have disappeared, and the liquor is either congealed or dissipated; the fibre appears to have an uniform cavity, but filled with a kind of reticular web, formed of many little cells adjoining to each other, and united by many transverse *fibrilla*. See fig. 2.

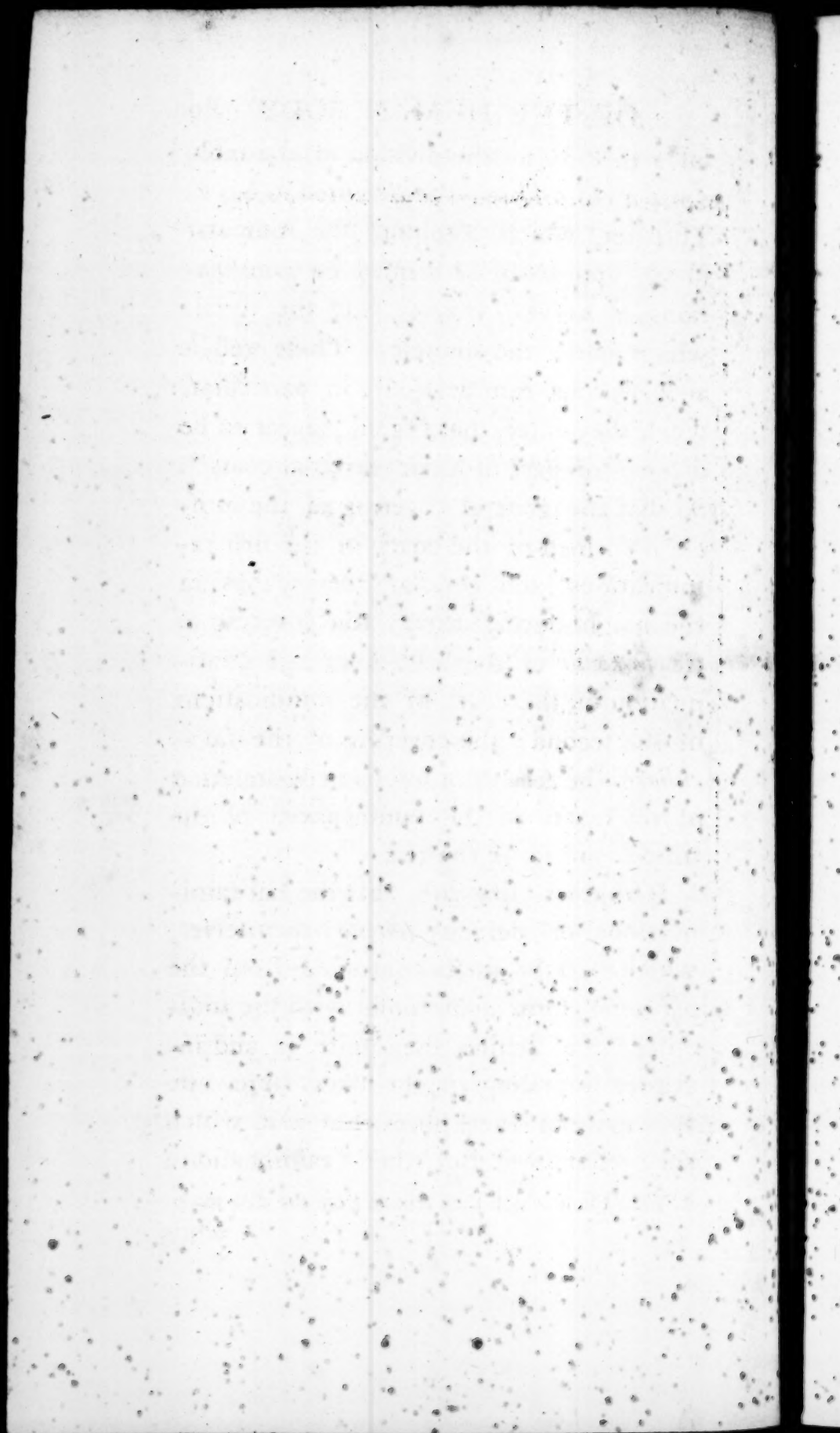
The muscular *fasciculi*, examined with the microscope, appear to be formed of many parallel contiguous fibres, bound together by a number of filaments, and much resemble a net. These fibres form anastomoses, and are blended in many places after the same manner with the cellular

Fig. 1.



Fig. 2.





lular threads in the division of the interior part of a fibre, as represented in fig. 2.

The net, which combines the muscular fibres, appears to be formed of ramifications of nerves, arteries, and the vessels which enter the muscle. These vessels and nervous ramifications in particular, when they enter that organ, appear to be divested of part of their external coats*. So that the general covering of the muscle is formed of the coats of the first ramifications, and cellular membranes of the neighbouring parts: the covering of the *fasciculi* of the first order is a continuation of the coats of the ramifications of the second: the covering of the *fasciculi* of the second order is a continuation of the coats of the ramifications of the third; and so of the rest.

It appears, likewise, that the last ramifications or nervous *fibrilla* themselves, which are the ducts continued from the *pia mater*, form anastomoses with the muscular fibres which they unite to and increase, impelling at the same time into the cavity of these fibres that fluid which they contain. But these ramifications,

* Viz. Those which they receive from the *dura mater*.

when

90 OF THE HUMAN BODY.

when divested of their external coat, form not the muscular fibres: it is very evident from the dissection of the muscles, that they are already formed before the nerve enters them. In the muscle of the eye, for instance, the branches of the third, fourth, and sixth pairs, are inserted at a great distance from the origin of these muscles; and that portion of them, which is above their insertion, cannot have been formed by these nerves, all whose fibres tend toward the eyes. But if that portion has some other origin, the whole muscle must have the same likewise: since the coat of that organ is only a continuation of the fibres of that part, and that portion itself is evidently the continuation of a tendinous expansion of the *periosteum*, the fibres of which, being dilated and united to the vascular and nervous ramifications, form that fleshy substance, called the belly of the muscle, and which is properly the organ of motion.

It is observed, that the muscular fibres, when they approach a tendon, are directed to it as to a centre; and it appears, that the whitish substance, which commonly terminates a muscle, is a continuation of the

the carnous fibres of its body, whose substance is too compact to admit the red part of the blood.

We may perceive likewise, in dissecting a fetus, that the extremities of the muscles are a continuation of the periosteum; the same may be remarked in adults, when the parts have been macerated in water; and it is known, that the periosteum takes its origin from the *dura mater*. Besides it is evident, that the branches of the nerves, which are inserted into the muscles, have not a sufficient substance to form organs of so large a bulk. The muscle is therefore a part entirely nervous, and receives its origin mediately or immediately from the *dura mater*.

Nothing is more simple, than the formation of these organs by the nervous fibres. When these fibres are so compact as not to receive the red part of the blood, and admit the fluid of the nerves only, they form the white substance at the extremity of the muscle. But when their diameter is sufficiently large to receive a great quantity of the nervous fluid, and when their interstices are sufficiently dilated to admit the reticular plexus of nerves,

92 OF THE HUMAN BODY.

nerves, small arteries and veins, which covers and unites them, they form the muscular fibres which compose the body of the muscle. This formation is very evident in the frontal and occipital muscles, in those of the outward ear, in those of the face, and in the muscular fibres of the ganglions.

It is proved by injection, that the blood vessels extend their ramifications through the whole substance of these fibres. If the arteries of a muscle be injected with any coloured oily liquor, the liquor will somewhat dilate the muscle, but will not be perceived in the cavity of the fibres, for they ever retain their transparency.

The fibres of a muscle nevertheless increase in bulk, which could not be unless they received a subtil lymph by their fibrillæ. The sanguiferous vessels therefore discharge into the cavity of these fibres a spirituous lymph analogous to that of the nerves.

Hence the arterial blood conduces to muscular motion, as the cause of that heat which is necessary to the fluidity of the nervous lymph, and as the source of that spirituous lymph which is substituted in

in place of the nervous fluid. It is by this mechanism that the ligature of the artery, which is inserted into a muscle, deprives that muscle of its motion; but it is not certain that this is owing to these causes only. It may be, that the sanguiferous vessels of this muscle, when relaxed by the suppression of the arterial blood, having lessened the bulk of this muscle, continue it in a relaxed state, and prevent the free course of the nervous fluid into its ducts.

Or perhaps a compression of the nerve, above its insertion into the muscle, occasioned by the distension of the obstructed artery, prevents such an influx. Whether it be so or not, the two reasons, which we have drawn from the necessity of the arterial blood to muscular motion, are sufficient to establish the consequences which I shall deduce therefrom in the remaining part of this work.

Hitherto I have not examined the body as relative to the organs of sense and motion, but in a general manner: I now proceed to a more particular examination.

94 OF THE HUMAN BODY.

Of the different Motions of the Body.

We distinguish at first sight in every animal, but more evidently in Man, two different kinds of motion; the purely voluntary, and the purely mechanical.

Voluntary motions have a character sufficiently distinct, without our undertaking to explain them; as to involuntary motions, we must range them into this order, viz. the action of the organs of life, and the action of the organs of digestion: we may here likewise range the functions of those organs, which preserve the body in a state of health, all those motions which follow every particular attitude of the body, in short, all which are the effects of the action of external objects on the machine, such as convulsions, spasms, &c.

I have already shewn, that the nervous fluid is the principle of motion; but although this fluid be the immediate agent in all the motions of the body, it acts not always in the same manner: at one time it is independent in its operation, at other times it is subordinate to the soul. I would extend my arm, and immediately my arm is extended; but should I will
that

that my pulse should cease to beat, and my heart discontinue its motion, such a volition would avail nothing; my pulse will continue to beat, and my heart retain its motion, independent of my will, and in opposition thereto. In the first case, I perceive a power which commands, and a power which obeys: in the last, I perceive a power which acts independently, and even contrary to the will of the commanding power.

Let us here dwell for a moment on these considerations, and we may draw from them these conclusions, which we shall lay down as general laws of the mechanism of the human body.

In all voluntary motions, the nervous fluid is subordinate to the soul, and becomes the instrument she uses in performing them.

In all involuntary motions the nervous fluid is the principal agent, and, combined with the various organs which it animates, performs independantly all these motions.

And here, if I might be allowed to make a short digression, I would observe, that in this law, which renders the life of the body independent of the soul, appears the
tender

96 OF THE HUMAN BODY.

tender care of Nature, anxious, if I may use the expression, to preserve its work.

Whilst we live upon this earth, where our existence is necessarily divided betwixt pleasure and pain, what man is there who does not, in those moments of sadness and disappointment, which so frequently assail us, impatiently wish for a dissolution; and who would not cease to live, if his existence depended upon a single act of the will? By not permitting us thus to terminate our misery, Nature has wisely reserved to us the means of recovering the wonted equilibrium of our minds; and by the ghastly and terrifying form of death, especially a violent one, instead of a propensity, she has implanted in us an horror of suicide; and preserves our being by an unconquerable antipathy to pain.

I have distinguished in every animal two kinds of motion, the one purely voluntary, the other altogether mechanical; but he must never have made any observations upon Man, who has not observed many actions, which cannot be ranged under either of these classes. Among these are bodily habits, occasioned by the same se-

ries

ties of motives frequently repeated in the same order, either accidentally or with design—Such as those habits we contract by art. Among these are the actions of those whom we call *absent men*, the gait or walk of a person whose mind, being intent upon any subject, attends not to his steps; and that motion, which tends to preserve the *equilibrium* of the body, when we stumble, or any way incline from the center of gravity; startings from a sudden and violent noise; the different lineaments which the passions impress on the countenance, and the imitative motions we perform, whilst looking upon the actions of an ingenious mimic *. All those actions, which philosophers consider as purely mechanical, are nevertheless not entirely so; nor is Man in this respect a simple *automaton*: yet these actions are not purely voluntary, but of a particular kind.

A performer on the violin combines the most diversified movements, and per-

* By attending to the action of a good mimic, the body of the spectator mechanically follows the same motions: our gestures imitate the gestures of those who appear to be affected by any of the passions, although we are not conscious thereof.

98 OF THE HUMAN BODY.

forms them in a manner extremely exact, without giving the least attention to any one in particular.

All these movements are performed by an infinite number of small muscles, which the will has power to set in motion, but which in this case do not stay for its command. Observe, however, that it is by an act of the will, that the performer determines to play any particular tune: here it is necessary that the soul first set the whole machine in motion; the rest follows without its concurrence in any shape. The case is the same in the gait or walk of a person, who is intent upon his subject, but not upon his steps. In all these instances, the motions are partly voluntary, and partly mechanical.

When the performer first begins to practise these motions, he has occasion for the action of the will every moment, to dispose them in their proper order, and his soul is scarcely able to direct so prodigious a number of muscles, which in this case act clumsily and irregularly. If the action of the will no longer appears, when the execution becomes easy, it is not because it cannot easily be discovered amidst the inconceivable rapidity of its operations; but because it really acts not any more.

An

OF THE HUMAN BODY. 99

An observation, which must doubtless have occurred to the reader, is, that our organs not only perform such motions, but are so many mechanical instruments, which are set in motion by the other faculties of the soul: for not only the will gives the first impulse to our organs; every different faculty of the soul acts on them in its turn; sometimes they are wrought on by sensibility, sometimes by instinct, and sometimes by the imagination: whence it follows, that the nervous fluid is immediately subject to every one of these faculties.

In those startings, which are occasioned by any sudden and violent noise; in the lineaments which are impressed on the countenance in the different passions, in that oratorical action which accompanies an animated speech, it is the soul, or rather it is its sensibility only, which agitates the body.

In those loathings and antipathies which seize us at the sight of any offensive aliment, in the horror excited by any shocking action, it is the imagination which affects our intestines, and occasions convulsive motions in them.

100 OF THE HUMAN BODY.

The motions which tend to preserve the equilibrium of the body, when it inclines from its center of gravity, and the actions of an infant, which precede all knowledge, and even the gradual unfolding of the intellect, have their source neither in the will, nor in the imagination; and spring neither from sensibility, nor from mechanical laws, but from instinct acting through our organs. Let us admire the wisdom of Nature's laws, seen in the manner wherein the different spiritual faculties of Man concur to all his actions. Without this wonderful concurrence, to what a state should we be reduced? Continually obliged to fall in the will, and the understanding to direct our bodily actions; and even those minute motions, our lives would be a tumult and before we could accomplish any one purpose, we would be lost, and thus subservient to the necessities and motions of the body, have leisure to enlarge its faculties; and those noble endowments, this *divina particula aura*, would have remained for ever in a state of inaction. How much time is saved, and how much of some perplexity avoided

avoided by these wise laws! Has Man an inclination to act? No more is required than a simple impulse of the will, a single resolve of the mind; and it is done!

I shall conclude this article, with some particular observations on voluntary motions.

We can, in obedience to the will, contract or relax a muscle with astonishing celerity, or by gradations more or less protracted.

How does the nervous fluid produce that surprizing action of the muscles, in which motion and rest alternatively succeed each other in the same instant?

This problem, if it can be resolved, is not connected with my present subject.

We have seen that a ligature of the duct of the *medulla spinalis*, is followed by a paralytic affection of all the parts of the body which are situated below it; that the soul cannot then contract nor relax any of the muscles of these paralytic parts; we have seen that the seat of the soul is in the meninges; all voluntary motions are therefore made by the instantaneous influx of the nervous fluid into the muscles.

I beg the reader to consider this not in the light of an hypothesis, but as an uncontroverted

102 OF THE HUMAN BODY.

questionable truth established upon facts. Some pretend, nevertheless, that this instantaneous influx is a chimera; "Since," say they, animals have been seen to live, "walk, and perform all their functions "after their heads were taken off." But what they ought to have done, but did not dare to undertake, was to have shown in all these pretended functions, some act of volition, some action which had an aim or scope, or which tended to some visible end. Animable life, is a function independant of the soul; and walking or flying, when they have no tendency to any end, are no more than continuations of motions which are purely mechanical, and are produced in this case by the convulsions of an irritated sensible substance?

Another observation which depends upon the preceding, and which we shall apply hereafter, is, that all involuntary motions, such as those which constitute life, being independant of the immediate influx of the nervous fluid, *there is required a less quantity of that fluid to perform them, than to perform those which depend on a determination of the will.*

We might likewise confirm this truth by the force of the contraction of the organs allotted for voluntary motion, compared with the force of the contraction of those organs which perform only mechanical movements. That the force of this contraction is proportioned to the quantity of the nervous fluid, may be proved from the strength of animals, in which this fluid abounds, compared with the languor of a body which has been deprived of it. This is the reason, why, in aged persons, life survives the total extinction of strength, and why, in bodies worn out by sickness, the organs of life are the last which lose their motion.

Of the organic Elasticity of the FIBRES.

The organs of motion are composed of muscular fibres, which are themselves composed of organic fibres, or fibrillæ.

During the life of any animal, the nervous fluid, which is continually circulating through its fibres, fills them to a certain degree, supporting their coats which are thus in a certain degree of tension. This continual tension is termed the *natural tone of the solids*.

104 OF THE HUMAN BODY.

By the elasticity of their fluid, they resist or give way to any power which endeavours to extend or compress them.

Now this resistance in the fibres to extension, and to the pressure of objects, with the power of returning to their primitive state, is called *organic elasticity*: a property of the solids which must be carefully distinguished from their primitive elasticity or simple resistance of the elementary parts of the fibres to their dilution. This latter is a property common to matter in general; whereas the former is the effect of the structure of the fibres, combined with the action of the fluid which fills the cavity of the nervous tubes and also the cavity of their fibrillæ.

Of the ORGANS of Motion, considered relatively to their different Degrees of primitive Elasticity.

I will not now spend time in determining the form, the figure, and the diameter of the simple fibres, which compose the fibrillæ of organic fibres; this is more than I dare undertake: I will only observe, that

that the elasticity of the fibres * which form the substance of the nerves and muscles, is proportioned, like that of all elastic bodies, to the form of their constituent parts, to the density of their substance, and to their diameter: in a word, to their geometrical dimensions.

Let us leave that undeterminable question concerning the infinite divisibility of matter; whatever may be the configuration of the elementary parts of bodies, it is certain, that there is a configuration of parts, which strictly follows geometrical dimensions. The more oblong these particles are, and the more they incline to an acute angle; the greater is the resistance they make; the less easily they can be separat-

* The nerves are extremely elastic, although certain philosophers affirm the contrary. Their elasticity very evidently appears, upon inspecting a nervous ramification in an extended muscle. It is perceived, by depressing the carious parts of the body in a state of health; but especially by examining fibres which are affected with a slight inflammation. The gelatinous substance of which they are formed, and into which they are resolved, is extremely elastic; and are not the strings of musical instruments which are so exceedingly elastic, nervous substances?

ed one from another; the more elastic the substance they compose will be.

For the same reason, the more closely the particles, which form any body, are united, the greater resistance it makes, and the more elastic it will be.

This very evidently appears in all bodies, which greatly abound with lymph: paper, when soaked in water, is lax and soft, but its elasticity returns when the water is evaporated.

It is the same in regard to metals; by much beating, they are rendered more elastic. It is evident, in air of different temperature: and cold by condensing bodies, increases their elasticity; whilst, on the contrary, heat dilates them and weakens it.

In their enquiries into the first elements the solid parts of the body, physiologists have supposed all these organs to be formed of many minute nervous fibrillæ, and have inferred from the evidence of facts, that these fibrillæ are composed of others much more minute, but without

* I beg my reader to remember, that I suppose an equality of the terms of comparison, although I do not constantly express it.

cavity,

cavity, resembling the filaments of skins, which have been resolved by maceration.

They assign these fibrillæ without a cavity, as the first elements of our fibres; but it is evident, that they have for their principles the same elements with the nervous lymph, whereof all our solids are compounded.

The substance of the nerves and the muscular fibres being homogeneous, we may readily comprehend, that the different degrees of elasticity, deduced from the configuration of the elements of bodies, is not to be included in our calculation. As to the combination of these different elements, it is certain, that the more compact the substance of the simple fibres, and of the fibrillæ of the nerves, the more elastic they will be. This truth, which is confirmed by constant experience, is evident from theory itself: but those which are to be deduced from geometrical dimensions are less evident, they appear not at first sight, and are not discovered without the assistance of art.

The laws of the elasticity of bodies, which regard dimensions, are little, if at all known. This matter, I believe, has
not

108 OF THE HUMAN BODY.

not been yet treated of by any one; I shall attempt to determine these laws in a clear and concise manner, but to perform it with the greater success it will be necessary to examine the subject in its fullest extent.

In two bodies, the less the diameter of the one, the length in both being the same, so much less is its strength: also, the less the length of one of two bodies, their diameters being equal, the greater will be its strength. Because the elementary parts of bodies make less resistance in proportion as they are less solid, and the less extended a body is in length, the more equal will its density be in every part; so that it makes, in all respects, a more equal resistance, and consequently yields the less to the pressure of any power acting upon it. This is the reason why a spherical figure is the strongest possible.

Philosophers have deduced from these observations the same consequences with regard to the elasticity of bodies, which we have drawn from them in regard to their force; to me it appears, that, in this respect, they have greatly erred.

By

OF THE HUMAN BODY. 109

By *elasticity*, I mean that property by which certain bodies return to their primitive state, when the power which compressed them ceases to act on them.

Elasticity then is to be estimated by the difference between the space, occupied by a compressed body under pressure, and that which it occupies when the pressure ceases; and by the space which the extremities of a body extended longitudinally, move from their natural position, and not by the resistance they make to this pressure. Otherwise a large oak, which the strongest wind has not power to bend, would be more elastic than the reed, which yields without resistance to the slightest breath of air, and always returns to its former erect position. Or, to make use of another example, a bar of steel, which the strongest arm cannot bend, shall be more elastic than the spiral spring of a watch, which easily yields to the action of the moving power, and retains for many years its property of always returning to its primitive state. That body therefore is the most elastic, which yields the most to the pressure of any power, and on which that power leaves the least impression.

Not

110 OF THE HUMAN BODY.

Not only the consequences are false which have been deduced from the observations here given, but there appear between the force of a body which depends on its dimensions, and its primitive elasticity, relations of a quite contrary nature.

It is certain, that a spherical figure is the strongest; but take a body whose substance is the most elastic, as for instance, steel, fashion it into a globular form, and try if you can perceive in it the least elasticity.

A tennis ball can be no exception, it being an heterogeneous substance, composed of an infinite number of rectilinear and curvilinear longitudinally extended bodies, wound one upon the another, and included within a common covering. A bladder distended with air is not more conclusive; for we are here speaking of solids, not of fluids. It will be equally impertinent to say, that a ball of marble, when forcibly impelled against another body of the same nature, rebounds with great force. Even supposing I cannot assign any reason for this phenomena; what will you be advantaged thereby? It is plain, that to form a conclusion sub-

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OF THE HUMAN BODY. 111

verſive of the principle here eſtabliſhed, you muſt prove that this phenomenon ariſes from the elasticity of the ball of marble, and muſt be attributed to its ſpheric form, and not to the air as a medium, nor to any other cauſe.

But take another piece of ſteel, its length being three or four times its diameter, and you will perceive a ſmall degree of elasticity. Lengthen this cylinder, preſerving the ſame diameter, and you will perceive in every one the elasticity to increaſe with this dimension. Select any elastic body you pleaſe, the reſults will be always the ſame. The elasticity of any body therefore increaſes in proportion as its ſtrength dimin iſhes.

From this obſervation I lay down theſe two conſequences, as demonſtrative principles : 1. That, *In nervous fibres of an equal length, that which has the leaſt diameter has the greateſt elasticity; and among thoſe of an equal diameter, that which has the greateſt length has likewiſe the greateſt elasticity*.*

Finally,

* To prove the contrary, the inſtance of a watch ſpring may be adduced, its elasticity being increaſed by

112 OF THE HUMAN BODY.

Finally, an observation which at first will appear surprizing, and which is the result of the preceding, is, *that the elasticity of a body of a large diameter is augmented in proportion to the loose connection of its constituent parts.* Hence the reason why the organs of aged persons, by a continual assimilation of the nervous lymph, become rigid and very little elastic. Hence likewise it is, that in persons of an advanced age, the use of emollient liquors dilating the pores of the solids, somewhat restores their elasticity.

Such in general are the laws of the elasticity of bodies dependent on their dimensions.

by the cold, altho' it is nevertheless shortened. This observation is just, but the consequence false. It is not by shortening this spring that the cold increases its elasticity, but by rendering its substance more compact. By being shortened, its elasticity certainly is lessened; but is augmented by its substance being rendered more dense. Thus the cold produces on elastic bodies two different effects, and on comparing them, we perceive, that elastic bodies gain thereby more than they lose; for, in order to weaken their elasticity, the cold acts only on one dimension, but to strengthen the elasticity, it acts upon all.

Of

114 OF THE HUMAN BODY.

scent, with the vapour of sulphur: acids prevent their ill effects, as it does those of all sulphurous substances. The action of fire deprives them of their qualities; and applied externally to the head, or soles of the feet, they produce the same effect as when taken inwardly.

Here we see that the purity of the nervous fluid is destroyed; and these effects of narcotics are also produced by many other medicaments. The insorption of the pus, in suppurated wounds, by which the nervous fluid is depraved, occasions an oppression of the spirits. The vapours which exhale from gold or silver mines, and the effluvia of infected air, produce the same effects.

This is the reason why formerly all animals languished, that approached the *lacus averni*. They who dwelt near it were weak and diseased, and their complexion pale and livid. The beasts gradually lost the use of their limbs, and putrefication presently ensued. The birds no sooner approached this infected atmosphere, than they seemed to have lost the power of flying. The moment they felt the effects of these destructive exhalations, their wings lost their elasticity; their

OF THE HUMAN BODY. 115

their bodies, their strength ; and they fell dead into the waters.

Not only external bodies deprave the fluid of the nerves ; but the fluid, if ever so pure, becomes vitiated, when it continues in the body a considerable time without motion.

This is evident in continent persons, from the stupor which is occasioned by corrupted semen. When the testicles of a bull have been compressed, and the seminal vessels rendered incapable of performing their functions, the parts adjacent to the matrix of the cow are covered with ulcers and carnosities, from the discharge of corrupted semen in coition. From these observations, let us lay down this general rule.

The purer the nervous fluid is, the better it is adapted to the motion of the body, and the greater is the organic elasticity of the fibres.

The nervous fluid is a compound, formed of an extreme subtil spirituous liquor, which is the principle of motion, and a gelatinous lymph which is likewise extremely subtil; and serves as a vehicle to

116 OF THE HUMAN BODY.

the animal spirits, to fix them and regulate their action.

The nervous lymph has a much greater share in the composition of this fluid, than the animal spirits, but not always in the same proportion, nor has it always the same consistence, nor the same fluidity.

If we consider but for a moment the functions of the animal spirits and nervous lymph, we shall easily perceive, that the fluid of the nerves must produce very different effects, according to the different combination of these liquors.

If the animal spirits be supplied to the nervous fluid in too small a quantity, the organic elasticity of the fibres will be extremely weak; if in too large a quantity, they irritate the sensibility of these organs by their pungency, as styptics, when they are applied to excoriated parts of the body, render them rigid. The fluid of the nerves therefore does not give our fibres all their elasticity, except when it is combined with the nervous lymph in a just proportion. Hence let us conclude, that the more fluid the nervous lymph is, the more instantaneous the action of the same fluid will be.

The

OF THE HUMAH BODY. 117

The more this lymph abounds in the nervous fluid, the weaker and more languid is the tone of the fibres. On the contrary, the greater the quantity of the animal spirits, provided that quantity be not so excessive as to occasion rigidity, the more powerful is its action, and the stronger the elasticity of the fibres.

I shall now examine the organic elasticity relatively to the quantity of the nervous fluid, its quality being the same.

As our fibres are hollow cylinders, formed of planes of parallel *fibrillæ*, let us view the phenomena which result from their structure, relatively to the quantity of the fluid which pervades them. When exhausted of their fluid, the fibres are then relaxed, and entirely destitute of organic elasticity.

Instead of being entirely exhausted, suppose, in these same fibres, a small quantity of nervous fluid, they will not be then so much relaxed, and will possess some small degree of organic elasticity.

But if the fibres abound with their fluid, and that not in too great a degree, they will yield to the impression of objects, their

118 OF THE HUMAN BODY.

re-action will be strong, and they will have their full organic elasticity.

However, to attain that end, the quantity of the fluid which pervades their fibrillæ, and that which pervades the tubes they compose, must be proportionate.

When this fluid is in too great, or too small a quantity in the tubes, it compresses too powerfully, or too weakly the fluid contained in the fibrillæ. In this case the coats of the fibrillæ are ill supported; in the other case they are rigid, and in both, the organic elasticity is very imperfect, and *vice versa*.

Finally, suppose these fibrillæ distended to excess by their fluid, they will then oppose a very great resistance to the action of any power; their re-action will be weak and difficult; in a word, they will be in a manifest state of rigidity.

We may therefore conclude, that there are almost infinite degrees of organic elasticity, whereof relaxation and rigidity are the extremes, and the most perfect tone the middle term.

The original elasticity of the fibres varies likewise with the different solidity of their coats.

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When too lax or too thin, their coats yield too easily to the action of the nervous fluid, and re-act but with little force.

When too solid, they difficultly yield to the action of that fluid, and re-act likewise but weakly. The medium, or a moderate degree of solidity, is therefore best adapted to communicate the due tone to our organs.

The Organs of SENSE, considered with regard to their different Degrees of Sensibility.

I shall here subjoin some observations, on the organs of sense; and first let us endeavour to discover upon what principles the force of our sensations depends; and since we cannot estimate the different degrees of the sensibility of our organs by intuition, let us deduce some rules from comparative anatomy, whereby we may be enabled to form a judgment of them. These rules must be drawn from the nerves. As these organs have so considerable a share in the phenomena of human nature, we cannot examine them too closely, in order to become perfectly acquainted with their structure.

120 OF THE HUMAN BODY.

The nerves are the productions of the meninges with which they unite, and form one substance. On examining the structure of the nerves by the nicest dissections, we observe that the meninges are formed of two lamellæ, and that each of these lamellæ has a duplicature, and its particular vessels, which never appear but when these membranes are inflamed.

The lamellæ of the *dura mater* supply the nerves with two thick and solid coats; the lamellæ of the *pia mater* supply them with two coats likewise, but of a thinner substance.

If we attentively trace the nerves from their origin, we may observe, that they always divest themselves of the membranes which they receive from the *dura mater*, when they form any organ of sensation, where exquisiteness is necessary; and even sometimes they divest themselves of the external lamella of the *pia mater*, when that organ requires a superior degree of sensibility: this is very evident in the structure of the eye.

The lamellæ of the *dura mater* cover the lamellæ of the *pia mater*. The lamellæ of these membranes are united by a cellular

lular web; the interior lamellæ form a reticular film, whose cells are replete with the nervous fluid.

When the nerve divests itself of its exterior coats, to form any organ of sensation, this cellular web, which I have just mentioned, being no longer constrained, dilates, and vegetates like the tendrils of the vine. The extremities of these nervous ramifications are extremely minute, and regularly bound together after the manner of a powder puff: sometimes their many nervous fibrillæ being uniformly united, form a contexture which much resembles velvet.

Thus the nerves, being but little sensible in their large branches, and yet less in their trunks, become more so in proportion as they are divested of a greater number of their coverings; for the substance of the parts which compose the organs of smelling, is more delicate and more sensible than that of the parts which form the organs of taste; the substance of the nervous parts which form the organ of sight is more delicate, and more sensible than that of those which compose the or-
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122 OF THE HUMAN BODY.

gan of smelling *. It is therefore evident, that the more substantial any nerve is, the more dense is its substance, and the less sensible it will be.

But care must be taken here, that we do not confound the appearance with the reality.

The whole nervous substance is indeed sensible, but how many are the causes which may render that sensibility of no effect to the soul? It is only by means of the nervous fluid, that the soul is conscious of the sensibility of the nerves, or rather, it is only by the aid of this fluid, that it receives the impression of external objects on the organs of sense. Thus, that the soul may perceive the sensibility of the nerves, if I may be allowed so to express myself, these organs must be composed of fibrillæ, which are replete with the nervous fluid, and the substance of these fibrillæ must be moved by the impression of objects in such a manner as to produce on the fluid they

* This is evident, if we judge of it only by the subtilty of their respective objects: that of the smell, is incomparably more delicate than that of the taste, and that of the sight is infinitely superior to both.

contain,

contain, the motions necessary to communicate their sensations to the soul. Hence a defect in the fluid of the nerves in the nervous fibrillæ; when their reticular substance is too compact to admit this fluid, or too lax to retain it; when the coats of the organic fibres are too solid to yield to the impression of objects, or too weak to re-act on their fluid; may be the cause, that an organical part shall seem to be entirely deprived of its sensibility. Hence the reason why the nervous film appears to be insensible; the capillaments which compose this reticular substance, being no longer real ducts, but closely compacted fibrillæ, have no communication with the soul. This is the reason why nervous fibres which are disposed to ossify, and those which are obstructed or covered, as it were, with a *stratum* of fibres entirely solid, appear to be void of all sensation.

If different causes may affect the sensibility of the nerves, as it respects the soul, so as to render it of no effect; different causes may likewise modify it. Let us still wave any enquiry into the reality of this, and

content

content ourselves with things as they appear to our senses ; and without fatiguing ourselves, by a fruitless endeavour to pry into the essence of our sensations as they are in themselves, and as they respect our organs, let us confine ourselves to consider what they are with respect to the soul, and to determine their different degrees of energy from the structure of the organs of sense, and from the force of the impulse communicated to their fluid.

The qualities of an organ, necessary to the highest degree of sensibility, may be reduced to two points, viz. its susceptibility of being strongly impressed by external objects, and that of forcibly communicating its impressions to the nervous fluid. The highest sensibility of an organ depends then on the extreme minuteness of its fibres, and on their very great elasticity: for the thinner the coats of the nervous fibres are, so they be strong enough to contain their fluid, the less they resist the action of objects, and the stronger are the impressions they receive, *ceteris paribus*. This is the reason why nature is so attentive to divest the nerves of their exterior coats,

coats, when ever she would form any delicate organ of sensation. Their sensibility is then increased in proportion to the minuteness of the nervous fibrillæ: and the more elastic they are, the better they will be adapted to communicate to the nervous fluid that impression which is requisite for transmitting to the soul the strongest sensations.

This truth, which is founded on mechanical laws, is confirmed by experience. It is certain, that in slight inflammations, in erysipelatous efflorescences and arthritic swellings, the fibres are the most tense, and the most sensible. It is likewise certain, that the soft fleshy parts of the body, polypous excrescences, all fibres which are lax and greatly abounding with lymph, as the fibres of dropical persons, possess a very small degree of sensibility, in comparison of the parts which are tense and not excessively moistened. Another observation, which confirms the preceding, is that in the natural state of our fibres, when we would receive any exquisite sensation, we distend the organ, as may be observed in the eyes and ears of attentive persons;

126 OF THE HUMAN BODY.

persons: the sensibility of our organs increasing with the elasticity of our fibres.

Let us conclude then, that *the highest degree of sensibility depends on the extreme minuteness and elasticity of the nervous fibres.*

By this method we may judge how the sensibility of one person differs from the sensibility of another, notwithstanding sensations are incommunicable.

BOOK

BOOK II.
A
TREATISE
ON THE
HUMAN SOUL.

WE have hitherto considered Man as a physical being, let us now consider him as a moral one. Let us turn our eyes inwards on ourselves, contemplate the internal Man, and investigate the nature of the soul: that we may do this in a manner becoming the dignity of the subject, let us reject the vain metaphysical refinements of philosophers, and wholly apply ourselves to useful enquiries and important truths.

If the body be an admirable machine, the soul is a substance yet more wonderful. The body indeed exists independent of the soul, but it is the soul which animates it.

This is that invisible agent which actuates the limbs, which produces that harmony of motion, and all those rapid and surprising movements we discover in the body. It is the soul which varies the physiognomy,
and

123 ON THE HUMAN SOUL.

and by turns impresses thereon grace, majesty, fear, meekness, innocence, and love. It is this which renders the countenance the index of the mind, so that we read thereon the thoughts which the tongue refuses to reveal. Without the soul, the body would be like a plant, separated from the soil whence it drew its nourishment, and would perish as soon as delivered from the womb, notwithstanding its admirable structure, from its inability, to select the aliments, by which the decays of nature might be repaired. But however great this power of the soul may appear, it is not confined to this.

The body is undoubtedly a sensible being; but it is by the soul only that we are enabled to judge of the union of both, and are conscious of that intimate communication, by which they are reciprocally sensible to the impressions of each other, and are indeed two distinct beings united in one.

It is the soul, which renders Man an intelligent and free being, by its innate energy, dissipates the darkness in which nature had involved him, whereby he becomes acquainted with other beings, his fellow

fellow inhabitants of this earth, and soaring above into the celestial regions, makes him comprehend all nature in his ideas; and is, in fine, the cause of that amazing knowledge and sagacity wherewith he is endowed.

It is the soul which assembles all the beings in nature before him, and, calling back past times, in some sort extends his existence throughout all ages; raises him above sensible objects; transports him into the vast fields of imagination; enlarges, so to speak, the boundaries of the universe; creates new worlds, and enhances his enjoyments by the possession of objects which never had a being.

In a word, the soul, by its knowledge and passions, enables this weak imperfect creature, Man, to change the face of nature; and, at his will and pleasure, to become either its tyrant or benefactor.

But let us consider these different objects separately; and examine the faculties of the soul, in the same manner as we examined the mechanism of the body. Let us trace them in their unfolding, and afterwards through the exercise of their functions; study the nature

130 ON THE HUMAN SOUL.

of the passions; discover their origin; see in what they differ; in what manner they are produced; how nourished; how they mutually assist each other; gather strength; oppose and curb each other; and lastly, in what manner they are combined. These are the different points of view wherein I intend to consider the soul: and although these subjects are, in appearance, dry and metaphysical, yet this part of my work will probably prove more entertainment to the reader than the preceding.

Of the Faculties of the Soul.

We have no immediate knowledge of the soul; all we know of it is by its faculties, and these are known to us only by their effects.

Man can perceive objects which are not cognizable by the senses; he has therefore a *sensibility* distinct from that of the body.

He can compare his sensations, and determine their relations and difference; he has therefore a *faculty of judging*.

He retains the sensations and ideas which he receives; he is therefore endowed with *memory*.

He

ON THE HUMAN SOUL. 131

He possesses freedom of choice, he therefore has a *will*.

These faculties of the soul have been long known to philosophers; and they are the only ones which modern philosophy acknowledges. But if we attentively consider human actions, there evidently appears in the soul another faculty, entirely different from the preceding, and is the same with that which in brute animals is called *instinct*: that is, a natural bias or proneness to particular objects, independent of, and prior to all knowledge.

It is this faculty which regulates the actions of Man in the early parts of life; and sometimes regulates them in his riper years, though without being perceived; for it is not owing to learning, nor to experience that infants suck the breast, apply things to the mouth, or extend their hands to the objects which please them; it is not reason which teaches them to fly from danger, or shrink from fire, when they first feel it burn them.

This principle is inherent in Man, though not always perceived. As it was given us to regulate our actions till such time as reason is sufficiently unfolded, so we find,

132 ON THE HUMAN SOUL.

that in proportion as reason appears, instinct gradually vanishes : and in those actions which it afterwards directs, as we seldom examine what passes within us, we are unable to distinguish such as are to be attributed to reason, from those which proceed from instinct.

A kind of titillation felt in the body generates love in the soul, but instinct points out the object. This is what causes the mutual propensity of the sexes, and prompts them to perpetuate their species. It is instinct which moves the mother to suckle her infant, teaches the hen to cover her eggs, and the wolf to nourish her young. But if Man ever had occasion for this principle, if he ever stood in need of its constant assistance, it must have been in the first days of Creation. Let us then view Man just as he came out of the hands of Nature ; and here we are not to have recourse to miracles, neither are we to imagine our first parents had any extraordinary means of subsistence ; we are to suppose the laws of nature acting, in the *primordial* state of things, as they act at present, seeing there is no reason to believe that they have

have varied; let us therefore endeavour to supply, by philosophical inferences, the chronology of those ages which are unknown.

Man, at his first coming into the world, is feeble, helpless, and entirely devoid of knowledge; he therefore needs strength, assistance, and judgment; even his senses are not then developed*; but supposing they were, he could make no use of them, not having as yet compared his sensations, much less distinguished them; he perceives no external object; in a word, he is an almost insensible automaton, and a scarce animated statue.

The senses gradually unfold, and are perfected by exercise; by degrees an infant learns to see and feel; the faculties of the soul, afterwards expand with those of the body, and rise to perfection by exercise. What notion are we to form of Man's condition, during this long interval? In what manner are we to suppose

* The eyes, indeed, discern the light, but indistinctly. The *membrana tympani* being relaxed, the ear cannot hear; and the nerves being yet in an inelastic state, all the senses are dull and imperfect.

134 ON THE HUMAN SOUL.

him to subsist, since we must not have recourse to celestial aid *?

Supposing Man's condition, at the instant of his creation, in all respects like that of a new born infant, and that nature, in the unfolding of his organs, pursued the same laws as at present, he must evidently have died of hunger, long before he could even be capable of distinguishing his proper nourishment. The human race therefore must have perished, had Man's original condition been a state of infancy: hence nature must have bestowed on Man at first all we want at our birth, with whatever is requisite for animal subsistence. The evidence of facts obliges us to believe, that Man came from the hands of the Creator, of full stature and strength, with all the faculties in perfection, as Pallas is said to have sprung the head of Jupiter.

Thus, although it is to be supposed that Man must have been created of full vi-

* I have heard some philosophers, more respectable for their piety than judgment, who supposed, our first parents had very strange modes of subsisting. Some pretended that they were fed by angels; others, that they were suckled by sheep; and others again, that they were endowed with intuitive knowledge.

gour,

gour, with all his senses perfect, we have yet advanced but very little: it remains to shew in what manner he was afterwards to subsist. It was not sufficient to suppose him endowed with bodily strength, that he knew how to avail himself of the information of his senses, and of the activity of his limbs; he must likewise possess the faculty of distinguishing his aliments: for, without this, all the rest of his endowments would have been useless. It may easily be conceived, in what manner Man, in process of time, could be enabled to acquire this knowledge; and it is evident, that this was not the first knowledge he did acquire.

When hungry or thirsty, how came he to know that eating and drinking would satisfy these cravings? Let those who pretend to deduce every thing from reason and experience, solve this problem. Confine Man's faculties to simple reason, and leave him to be instructed by slow experience, his whole life will be spent before he can attain the knowledge of his aliments; so that he might die of hunger at the foot of a tree loaden with fruit.

136 ON THE HUMAN SOUL.

of thirst on the bank of a river; or, from his ignorance of the nature of com-
 edible substances, eat poison. What
 then must have become of Man, had he
 been without instinct, his only infallible
 guide. Who does not see that, with
 this boasted reason, the human race had
 perished, notwithstanding all the precau-
 tions of nature for their preservation.

Some think to elude the necessity of in-
 stinct to Man, by alledging, that he imi-
 tated the beasts; but this is only shun-
 ning the difficulty, not solving it.

Taking it for granted that Man imitat-
 ed the beasts, it is evident, that this pro-
 pensity to imitation, must have been in-
 nate and prior to all knowledge: but how
 came Man by this propensity to imitate
 them? Besides, doth not this imitation
 suppose in Man a knowledge he could not
 have as yet acquired; a knowledge of the
 physical relation, between his nature and
 that of beasts? How many difficulties
 stand in the way of this hypothesis!
 And what a concurrence of circum-
 stances must be imagined! We must first
 prove, that Man was endowed with ca-
 pacity to observe the brute animals; and
 then,

then shew how he came to confine his imitation of them to certain particular cases; as for instance, why he imitated the goat, only when it browsed on the tendrils of the vine, and not when it cropped the hemlock; for otherwise he would have found a poison where he sought for food.

Hence it is evident, that by attributing to Man an instinct, whereby he supported himself in imitation of the instinct of brute animals, and admitting him to have imitated them in those cases only which are conformable to his nature, we attribute to him a guide different from reason. It were more eligible to allow him an instinct, by which he is enabled of himself to discern his proper nourishment; instead of allowing him any faculty which is still resolvable into instinct, though of another kind, and serves only to multiply difficulties unavoidable on such a supposition.

Reason then could not be a sufficient guide to Man; we must therefore allow him to possess an instinct, as an additional mental faculty whereby he is directed, like other animals, in the choice of his proper aliments.

Of

138 ON THE HUMAN SOUL.

OF INNATE SENTIMENTS.

Besides these faculties, there is in the soul an innate sentiment, *prior to all sensation*, and to all ideas with which nature has connected the preservation of human beings; I mean self-love, that powerful principle, which irresistibly directs mankind in all their actions, often without being perceived, the source of every passion, and the end to which all our desires are directed.

As this love is unbounded, and infinitely more strong than the love of others, simple as it is, it has been divided into two sentiments, different in their nature and effects, viz. love of ourselves, and love of preference: but it is easily perceived, that these are but one and the same affection of the soul, which is only distinguishable by circumstances.

When the love of ourselves acts simply in Man, without his comparing himself with others, it is a sentiment prompting him to seek after happiness or pleasure, and to fly from pain.

When it acts in opposition to the advantage of others, it induces Man to prefer

for himself to every other consideration, and to pursue his own good, even to the prejudice of his friend. In the first case, the love of self, prompting us incessantly to pursue happiness, becomes the source of a vast number of pleasing sentiments, with regard to the objects of our pleasure. In the second, the love of self annihilates every other sentiment, and changes its nature. It is this which turns fraternal affection into hatred, arms rival brothers for their reciprocal destruction, and instigates them to mutual murders on the ruins of a father's throne. It is this which, among savage nations, infills fury into the breast of warriors, steels the victor's bosom against his vanquished foe, so as even to make him devour the entrails of the slain yet palpitating with life. It is this which, in a city beset by an enemy without, and pressed by famine within, transforms the tender nature of females to savage fury, and makes the mother destroy the fruit of her womb. It is this, in a word, which inspires all those cruel deeds, all those sanguinary actions, which nature recoils to hear mentioned.

Another sentiment innate in the human heart, and which is felt only at intervals,

149 ON THE HUMAN SOUL,

is maternal affection, that indearing propensity, on which the preservation of our species during infancy depends.

This sentiment is independent of every other, and is as blind and undiscerning in its manner of acting as instinct itself.*

A modern author has attempted to deduce it from self-love. “The mother, says

“he, at first nourishes her little ones for her own, afterwards for their good.”

But how did the first mother know, that the suckling her child would be of service to herself? Besides, in how many other instances doth this affection appear? Constraint, disagreeable offices, every kind of self-denial, become pleasing tasks to a mother, and troublesome though they be, yet she constantly discharges them at the expence of her pleasure, rest, and often of life itself; — how many dangers do some mothers voluntarily undergo for the preservation of their offspring!

It is no less absurd, to deduce this affection from friendship. On what ideas of the merit of a new born infant, incapable of communicating any pleasure, and

* We frequently observe hens to hatch and feed young ducklings, and ducks to hatch and feed chickens.

scarce one remove from stupidity, can it be founded?

Hence it is evident, that the love of mothers for their offspring is a sentiment impressed on the human heart by the Creator.

A Refutation of the Opinion of Philosophers concerning PITY.

Some philosophers to the number of innate sentiments already mentioned add pity—that gentle emotion which moderates the love of self; interests the happy in the sufferings of their fellow creatures; and by the bond of philanthropy unites all human kind.

“We sympathize with the unhappy;
“we weep at the plaintive sorrow of the
“unfortunate, and are moved with the
“cries of those who are in pain.”

“At the sight of a ravenous beast,
“tearing the tender body of an infant, we
“feel extreme anguish, and the soul undergoes excruciating agitations.”

“Pity is so natural a sentiment, that it
“precedes reflection, and even brute animals have evident marks of it.”

“A

142 ON THE HUMAN SOUL.

"A horse starts back at the sight of a
"dead one, one dog licks the wounds of
"another, and cattle, when driven to the
"slaughter-house, vent doleful cries."

These are the proofs whereon those
philosophers ground their opinion.

At first sight it appears to be well found-
ed, but it is easy to conceive, that nature
formed not Man originally compassionate.
All men have not pity, savages but little,
children less, and Man, who, if this opinion
were true, ought to give the most evident
proofs of it, in the early part of life, betrays
not the least sign of any such sentiment.

If pity is an innate sentiment, why
the human heart is void of it in infancy?

Why, in those who are insane from their
birth, should this principle be likewise
wholly imperceptible, seeing they are not
deprived of the other faculties of the soul?

"Pity is a sentiment so natural, that
"the brute creation have many works of
"it."

What foundation is there for this asser-
tion?

"A horse starts back at the sight of a
"dead one, one dog licks the wounds of
"another, and cattle, when driven to the
"place of slaughter, vent doleful cries."

But

ON THE HUMAN SOUL. 143

But who is assured that this is not an instinct peculiar to brutes? Who knows, whether these external signs be not the effect of some disagreeable sensation, or rather, of fear excited by the horror of the sight, than marks of compassion.

Even in Man, the external marks of pity are not pity itself; we may have the strongest appearance of being affected, and not feel the least emotion. A person may zealously assist in dressing another's wounds, easing his aching limbs, and alleviating his misfortunes; merely from the hope of being relieved in his turn; another, from a motive of being upon good terms with heaven; and a third, wholly from the pleasure attendant on the exercise of virtue.

He alone who, on seeing the sufferings of the unfortunate, compassionates their lot, is a compassionate man. Now with a little reflection we may perceive, that pity is an artificial sentiment, acquired in society; it is founded on the idea of pain, and the relations in which Man stands with respect to sensible beings. For, to pity the miseries of others, he must first have an idea of them; he that has never suffered,

144 ON THE HUMAN SOUL.

fered, nor has any idea of pain, is unmoved at the tears, complaints, the long and vehement cries of the sorrowful heart; the sight of the sufferings of others does not affect him; their wounds appear disgustful; he shuns the sight of them, and keeps aloof, but never commiserates them.

To pity, we must be acquainted with the sufferings of our fellow-creatures, but not feel them. When we know by experience what pain is, we pity those who suffer; but when we ourselves are in pain, we then feel only what we ourselves undergo. In every station subject to the calamities of life, we allow to others that share of our sensibility only which we have no occasion for ourselves. Pity is therefore evidently no more than our own sensibility, directed by an act of the mind towards those with whom we sympathize. Thus pity and self-love are always in an inverse proportion.

They who, from an excess of delicacy, and a continual habit of indulging themselves in every sort of pleasure, are not affected by the sufferings of others; their

sensi-

Vol. I

sensibility is constantly employed on themselves; they are altogether unconcerned about all beings besides, and their hearts are steeled against the sufferings of mankind. In proportion as this love of self increases, pity decays, and frequently becomes extinct.

He who now melts into tears at the distresses of the unfortunate, was he his enemy, instead of alleviating, would aggravate his misfortunes.

Nero, who wished he had never learned to write when pressed to sign the warrant for a criminal's execution, could delight in the murder of his enemies. The tyrant *, that loudly bewailed the fate of *Hecuba* and *Andromache*, as represented on the stage, could hear without emotion the cries of those he had doomed to destruction.

Pity is not only destroyed by the passions, it is even generated in the heart only by prudent reflections, is nourished only by tender sentiments, and is extinguished by the frequency of those objects, which ought naturally to confirm it. Let us suppose a man has never heard any one discourse

* Alexander, tyrant of Phares.

146 ON THE HUMAN SOUL.

on ideas of justice, goodness, clemency and generosity; he must remain for ever ignorant of the very names of those virtues. By a frequent attendance at those bloody feasts, which, in some great cities, are given by avarice to idleness, you will soon lose all sense of the strong emotions you had hitherto felt at the cries of mangled animals; in time you will hear them with pleasure, and wait impatiently for a repetition of them. By often frequenting them, the soul becomes callous to their impressions; is unaffected with the prospect of human miseries, and insensible to every tender emotion.

Does not these reasons prove, that pity is not a native of the human breast?

The different powers of the soul, may therefore be reduced to these following, viz. sensibility, instinct, understanding, memory, will, self-love, and maternal affection.

When we consider the mutual connexion and dependence of these different powers, we readily perceive, that every production of genius, the effects of the passions, and all the other wonderful phenomena

mena of the mind, are produced by their combination.

What an admirable harmony! where so small a number of simple causes are united in so incomprehensible a manner, as to produce so many and so extraordinary effects.

The different faculties* and various sentiments immediately received by the soul from nature being discovered, I now proceed to examine these faculties, see how they operate, and in what proportions they are combined.

Of SENSIBILITY.

The nature of the sensibility of the soul is no better known than that of the body; all our knowledge of it is, that sensibility, whether of the soul or of the body, is a passive faculty, requiring the impression of external objects to set it in action.

The different impressions sensibility receives, may be ranged, in respect to

* We ought not to confound the terms *power* and *faculty*. Sentiment, passion, sensibility, memory, understanding, instinct, will, are all powers of the soul; but the powers of the mind only are properly termed *faculties*.

148 ON THE HUMAN SOUL.

their objects, into two classes, viz. *sensations* and *sentiments*.

The former arise from material objects, the latter from moral ones.

f INSTINCT.

Instinct, that occult faculty, which is neither derived from principle nor prior knowledge, the mode of whose operations is so singular, and which is, moreover, entirely accomplished by nature, interests us but very little. The notice I shall take of it as I proceed, will be therefore very inconsiderable.

Of the UNDERSTANDING.

All our knowledge of the understanding is derived from that of its operations only; we are ignorant of its essence, as we are of that of thought. But how wonderful is this faculty! How surprizing its operations! As an active principle, it perceives objects, compares, unites, and disjoins them in a thousand ways, judges of their relations: by these different combinations it acquires the knowledge of things, unravels the system of the universe, transports us into futurity, recalls
past

ON THE HUMAN SOUL. 149

past ages, collects into one point all the pleasures of life, extends our existence beyond the grave, and triumphs over death itself.

The understanding, though active by nature, has undoubtedly need of the sensations to enable it to act, but operates of itself when it has received this assistance : it is the will which selects the objects of its operations ; but it is the understanding alone which perceives them, determines on their relations, and forms its judgment without our interposition.

There are two distinct powers in the understanding, which philosophers have ever confounded *, viz. the power of perceiving, considering, and comparing objects ; and the power of judging of their relations. One of these is the basis of the other, and necessarily precedes it : by the first, we compare the different sensations in their several appearances ; by the second, we judge of their relations, and thence form our ideas.

* The understanding operates with so great activity in certain cases, and the judgments follow so extremely close in others, that they are easily confounded.

150 ON THE HUMAN SOUL.

We divide the understanding with respect to its modes of judging, into reason and imagination: these are simple modifications of the same power, which philosophers have taken, from I know not what cause, for two different faculties of the soul.

When the understanding is employed in comparing sensations, which are either immediately received, or transmitted from the memory, and when it judges of their real relations, it is called *reason*. When the same faculty is exercised on the same objects differently combined, and when it forms such an assemblage as has no model in nature, it is called *imagination*.

It was reason which suggested those striking characters of men we find in *Shakespeare*. It was imagination which collected whatever is beautiful in nature on one hand, and whatever is horrible on the other, to form those admirable descriptions of Elysium and Tartarus in *Virgil*.

How different soever reason and imagination may appear, they are certainly one and the same faculty, distinguished by the different mode of exertion only. If we consider

ON THE HUMAN SOUL. 151

sider them but for a moment as different faculties, we may justly reproach those who have hitherto treated upon this subject, with having improperly distinguished them, and with not having rightly defined their extent.

Even *Helvetius*, who has more minutely handled this subject, has too much confined the power of the imagination, by defining it the power of conceiving things in a figurative manner, and of rendering ideas by images. If it is the imagination which gives being to a sphynx, creates the gardens of Hesperides, or the enchanted Isle of Armida: it is still the same faculty which, with the help of atoms, lines, surfaces, and solids, builds the worlds of *Epicurus* and *Des Cartes*. It is the imagination which collects the different events of human life in romance, combines them, forms intrigues, like those which the passions are capable of producing, and gives them the air of true history, though they are only the work of genius and sensibility. It is imagination that launches into futurity, prevents the rapid flight of time, transports us beyond the grave, restores

152 ON THE HUMAN SOUL.

sensibility to our ashes, and eludes the power of death.

The peculiar characteristic of the imagination is invention; I have said, that its productions are not formed upon any model in nature; such a model may indeed exist, but must not be known, otherwise it is no longer invention; and all is reduced to mere narration: the picture then becomes a copy; the romance, a history; and imagination, reason.

Of the FORMATION of our IDEAS.

We distinguish objects by their respective sensations. On comparing these different objects, we find in them some common properties, and some that are peculiar to each object. The knowledge of the properties and relations common to different individuals, are called *ideas*.

Of this sort are the ideas of extension, impenetrability, gravity; properties common to all matter: as also that of a triangle, taken from the meeting of three right lines at their extremities.

The more considerable the number of single objects, whose properties are common

is,

is, the more extensive is the idea: the idea of body, for instance, is much more extensive than the idea of metal.

Although every idea is a particular one, yet there is no simple idea of any single object, much less of species or kind; because every idea is composed of those properties which objects, when compared, have in common: now every individual object, every species, and every kind, besides those common properties, have several which are peculiar. What metaphysicians have given for simple ideas, and even Locke himself, is only a compound of abstract ideas. We may easily be assured of this, by analysing their definitions; how great so ever the number of ideas which enter into the mass may be, you will oftentimes find that number too small, to define the object whose idea they are intended to convey; as in the ideas of Man, animal, virtue, plant, &c. Hence arise those eternal disputes, to which almost every metaphysical enquiry is liable, and to which they have so frequently given rise. Hence the many absurd conclusions which flow from the systems of philosophers; examine their definitions, and you will find the idea of a virtuous

134. ON THE HUMAN SOUL.

virtuous man, according to *Socrates*, very different from that of a virtuous man, according to *Diogenes*; and the idea of Man in *Aristotle*, is by no means the same with the idea of Man in *Plato*. What seems to have led metaphysicians into this error was, that, as the several properties of bodies appear always combined in the same subject and always the same, they inferred, that they must all appertain to the same subject, and when they affixed a name to that subject, they considered the assemblage of these qualities, not as a compound idea, as it really is, but as a simple uncompounded idea.

Although every idea may be equally abstract, all are not of the same nature. Some, which are formed from the relations of corporeal beings compared together, have only material properties for their objects; such are the ideas of extension, burning, hardness, motion, &c.

Others, which are formed from the relations of sensitive, active, and intelligent beings, compared together, have only intellectual properties for their objects; of this sort are the ideas of goodness, justice, beauty, &c.

The former are denominated *physical*, the latter *moral ideas*; by the first we acquire the knowledge of the material creation; by the latter, we are transported to the intellectual world, and acquire the knowledge of spirits*.

Of MEMORY.

How many different words! How many adventures! How many volumes are contained in Man's memory! How many languages! What a field of history and chronology! But what is the nature of memory, this vast receptacle of so many sensations, and so many ideas; where

* The face of nature varies with our different modes of thinking; to the ignorant and atheist, all is inanimate matter, and the universe consists of none but corporeal beings: how different is its appearance to the learned and religious! To these the entire world assumes a new aspect; they perceive every where the beneficent hand of Providence; they discover the Creator's goodness in every production of the earth; their table is spread with the instances of his bounty; they repose secure under his protection, are instructed by his chastisements, and enjoy every pleasure as the gift of his hands; they discover all around them, the goodness of the author of being, and, to them, all nature seems with life.

156 ON THE HUMAN SOUL.

so many acquirements are deposited, where events, swallowed up by time and never to return, are preserved from the eternal night of oblivion; where times which are no more, enjoy a kind of perpetuity? A new prodigy this! as admirable as the understanding itself, and concerning whose nature and origin we are equally in the dark.

Memory is grounded on the sensations and ideas, but is entirely different both from sensibility and from the intellect. Without sensibility, there can be no sensations; without the intellect, there can be no ideas: but when the sensations are once received, and the ideas formed, the soul no longer requires the aid of these faculties to retain them. Hence memory is a particular faculty; and is the power of preserving the impressions and ideas of objects which have affected us; in a word, it is the mirror * of past sensations, ideas, and sentiments, as sensibility is the mir-

for
* Some superficial philosophers, always ready to explain what they do not understand, having observed, that the memory much depends on the organization, have concluded that this faculty is wholly mechanical. Some accidents,

ror of sensations and sentiments which are present to us.

Of
 “accidents, say they, which happen to the body only,
 “weaken and destroy the memory; it therefore re-
 “sides in the organs of the body.” But how is it pos-
 sible in so intimate an union, as that of the soul and
 body, for an accident to affect the one without affecting
 the other at the same time? How is it possible to con-
 ceive this accident as acting separately on the one only?
 Besides, the same causes which destroy the memory,
 likewise destroy reason; are we therefore to conclude,
 that the judgment is an organic faculty? That physical
 causes oppress, or prevent the exercise of our faculties
 in whole or in part, is the true consequence to be de-
 duced from these observations. What then can be
 more absurd, than to suppose the memory a corporeal
 faculty?

They who maintain this absurdity, bring many argu-
 ments equally absurd to support it. They say, “The
 “sensations are vibrations of the nervous fibres produced
 “by external objects, and the memory is the receptacle
 “of all these vibrations.” But in what manner could
 they explain, by the help of this, the wonderful phe-
 nomena of the memory? Were it true, that the sen-
 sations are produced by the vibrations of the organ af-
 fected; it is false, that they are communicated to the
 soul in the same manner: but suppose this to be true
 likewise, what will they gain by this?

“The remembrance of sensation is continued for a long
 time; the vibrations which cause them, according to
 this hypothesis, last only a few moments, even in the
 most elastic chord; how then is it possible to conceive
 that

158 ON THE HUMAN SOUL,

Of REMEMBRANCE *and* RECOLLECTION.

Philosophers have fallen into as gross errors with regard to the memory, as they have with regard to the understanding.

Locke,

that they should endure for a long series of years in the fibres of our organs, not near so elastic, and also in the fibres of the brain, which are incomparably less so? Thus, by supposing the sensations to be produced by the different vibrations, when the fibres cease their tremor, the vibrations instantly cease: what sensations then can remain in the memory, besides those with which the organs are actually affected? Our philosophers, when called upon to explain how this long duration of sensations is to be accounted for according to their system, gravely answer: "These vibrations of
" the nervous fibres in the brain produce a kind of durable impression, whereby the sensations and ideas are
" fixed in such manner, that an intellectual Being, perfectly acquainted with the organization of the brain,
" and capable of distinguishing, in a very accurate manner, every impression in it, might read their characters
" as in a book; that this prodigious number of extremely minute organs, appropriated to sentiment
" and to thought, would be to such a Being what
" printers types are to us." What a pretty conceit this of impressions on the brain! Where did these fables see the impression? On what foundation do they build so strange an hypothesis? They tell us, it is by an impression these sensations are preserved; but what they take no notice of, although it is of the utmost consequence

Locke, the first rational metaphysician, he who rescued the science from that chaos of obscurity, in which it was involved by

sequence to be explained, is in what manner these simple vibrations are thus impressed. But why talk of vibrations? It is the nervous fluid which carries the impressions to the soul. Supposing this fluid could thus imprint characters on the brain, how can it produce a durable impression on so soft a substance?

But to say no more about all these absurdities, there will still remain, in their system, a number more than sufficient to demonstrate them to be grossly mistaken. By these vibrations and impressions they believe the retention of our sensations accounted for: but how do they account for that of the ideas? There is certainly no vibration, nor any fibre; how then is this impression produced? Besides, by making the memory a purely organic faculty, the objects of which are the impressions and characters engraved on the brain, we can never conceive the reproduction of the sensations of the mind, as independent of the reiterated action of these objects on the senses, that is to say, without the presence of the objects which produced them.

It frequently happens from diseases, that we forget almost every thing, and that recollection returns afterwards by slow degrees. If then the characters and impressions which preserve the image of objects in the soul be of this nature, when they are once defaced, there is an end of all the sensations deposited in the memory, and this faculty can no longer exist.

Let us conclude, that the memory is a faculty purely spiritual, like the judgment and will,

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160 ON THE HUMAN SOUL.

the schools, has defined memory, "the power to revive again in our minds those ideas which, after imprinting, have disappeared, or have been laid aside out of sight." They who succeeded him, have given the same definition. Some moderns, who observed the possibility of remembering an idea without the power of recollecting it, have with reason supposed that Locke is mistaken. They distinguished in the soul memory*, remembrance, recollection, and made them so many particular faculties, in which they are mistaken in their turn. For if we care-

* They who account memory a corporeal faculty, make remembrance and recollection purely physical faculties. The soul retains a consciousness of what it has perceived before, it is likewise conscious of the novelty of any sensation. These philosophers suppose it to be owing to some change in the affected organ, or by some difference in a particular impression, that the soul distinguishes a repeated, from a new sensation. But what change can the action of objects, but once repeated, occasion in the organ which receives it? Besides by attributing, as these philosophers have done, a sense of novelty to the *virgin state of the fibres*, what other means will the soul have, of knowing whether or not it has experienced that sensation, than comparing it with others which are laid up in the memory.

fully

fully consider the mutual connexion of our faculties, we easily perceive, that remembrance and recollection are only effects of our different intellectual powers, reciprocally combined.

When the soul is affected with sensations and ideas; the retention of these sensations and ideas I call *memory*.

We frequently experience the same sensations and ideas, which we have experienced before; the reproduction of these sensations and ideas, with a sense of their identity, is what I call *remembrance*.

We can assemble at pleasure a series of past ideas and sensations; this faculty I shall term *recollection*.

Memory is a faculty purely passive like sensibility; but the remembering of particular sensations or particular ideas, is not simply the perceiving our sensations present and past, but the knowing the sensation or idea, which we actually experience, to be the same we experienced before.

The memory is the power of retaining past impressions. Sensibility that of perceiving those which are present to us: one is the storehouse of things past; the

other, of things present : but it is in the understanding alone that the power resides, of perceiving in these storehouses, things past and present, of considering and comparing them, and determining, whether their impressions are altogether new, or only reproduced ; in a word, the understanding alone is conscious of their identity. Hence we perceive that remembrance is not a simple faculty, but is compounded of memory, sensibility and understanding.

In recollection likewise, it is not the memory that retraces past sensations and past ideas in our minds : if we attend ever so little to what is passing within us during the succession of our thoughts, we may be convinced, that it is the understanding alone, as being continually actuated with some sensation, or idea, which passes from those with which it is actually affected, to analogous sensations, and to ideas which have formerly affected it, and which thus recalls past things to the mind by means of analogy. Thus, when we chuse to recollect any sensations or ideas, we perceive them ready to present themselves,

ON THE HUMAN SOUL. 163

as soon as the mind runs over the nearest analogies.

If this power of rendering present to the mind, the sensations and ideas treasured up in the memory, sometimes act without our interposition, it is also sometimes subject to the will. Recollection is not therefore a simple faculty, but the aggregate of many faculties united. In remembrance, memory is combined with the understanding, and present sensations ; in recollection it is combined with the understanding and the will, but without these sensations. It is thus that these different faculties jointly produce remembrance and recollection.

Of the Will.

It remains, that we enquire into the nature of the will ; a singular faculty, which is sometimes directed by the understanding, but is always governed by sentiment ; has a strong propensity to pleasure, and abhorrence of pain ; and, from that mixture of good and evil, which the understanding presents to it, chooses the one, rejects the other, and with an absolute authority determines

164 ON THE HUMAN SOUL.

Man towards action or rest. We are acquainted with the nature of the will only by our consciousness of its existence and effects; notwithstanding all our efforts to dive farther into its nature, and let our sagacity be ever so great, our endeavour, will serve only to involve us in darkness and confusion.

The will, considered in its effects, is a faculty sometimes active, and sometimes passive. Active, when it impels man to action; passive, when swayed by sensation.

The will is always subordinate to sensation; for man is by nature continually under the influence of sensibility, and can no more resist its dictates, than he can will his own hurt, or oppose his happiness.

Origin of the different Sentiments of the SOUL.

The love of happiness is innate in every heart, like the love of ourselves from which it is derived.

Every man loves himself; but nature, by creating him subject to wants, has not permitted him to love himself alone. The whole of his sensibility therefore cannot be centered within himself; there

are

are things in nature, to which he is connected by the heart and affections. Man cannot, like the supreme Being, be happy in the contemplation of himself, and without the assistance of others. The inexpressible anguish we suffer from the loss of a friend that was dear to us, flows only from a vacuity in the heart; reason discovers the void, and till some new object offers to possess it, our grief continues.

Sensible beings can only be affected by pleasure and pain. The soul therefore receives only two kinds of sensations, the pleasing and the painful: these two sensations are differently modified, but they are always distinguished by two general characters only. There are no indifferent sensations: those which are so called are but the lowest degrees of pleasing or painful sensations, too weak to influence the soul, and determine its action. But as Man is a compound of two sensible substances, and as each of these substances has its particular object, there are two kinds of the pleasing sensations, and two kinds of the painful, viz. the sensations of the body, and the sensations of the soul.

166 ON THE HUMAN SOUL,

The impressions of objects on the senses are transmitted to the soul, and there the sensations unite : hence the soul partakes of the pleasures and pains of the body ; the soul likewise has sensations which are peculiar to itself.

Thus all the good we enjoy, and all the evil we suffer, proceed from two different sources, viz. moral and physical objects. Man therefore receives impressions of pleasure both from objects which act on the body, and on those which are purely intellectual : the latter are called the pleasures of the mind, and the former, bodily pleasures. The same division will also apply to painful sensations : and from these, according to the predominancy of either, proceed all the happiness and misery of human life.

We must be careful to distinguish sensation from sentiment. *Sensation* is a pleasing or painful affection of the soul, produced by the impression of objects on the senses. *Sentiment* is a strong affection of the soul, produced by the relation which the understanding perceives between us and physical or moral objects.

Every

Every object that affects us, if its sensation be pleasing, instantly creates in the soul the sentiment of *love*; or, if its sensation be the reverse, the sentiment of *hatred*: for it is a consequence of the love of ourselves, that we love what is profitable to us, and hate what is prejudicial to us.

From these sentiments of love and hatred, combined with our different situations in respect of the objects of our sensations, proceed many other sentiments. When we are agreeably affected by any object, which it is in our power to enjoy at will, a sudden pleasing calm creeps on our senses, our wishes seem satisfied, the soul sinks into joy, and is insensible to every other sentiment. But if this object be not within our reach, the privation of it excites in the soul desire, attended with a painful emotion. On the contrary, if the sensation be disagreeable, and we cannot avoid the impression of the object which causes it, we experience neither joy nor desire; and sentiments of *grief* and *aversion* arise in the soul.

From our different situations with regard to different objects, arise two other

168 ON THE HUMAN SOUL.

emotions, hope and fear; *hope*, is that soothing and delightful sentiment which enables us to support the load of life, when under the oppression of misfortunes; *fear*, on the contrary, is a painful sentiment, which has been often known to shorten the duration of Man's existence.

Hope and fear are affections of the soul analogous to joy and sadness, and, as it were, shades of these affections. Joy and sadness are extremely active sentiments; one springs from the pleasure of enjoyment; the other from the pain of suffering.

Hope and fear are moderate sentiments, proceeding from sadness and joy. The first springs from the probable view of happiness; the other from the probable view of misery: their force is ever proportionate to the degrees of the respective probability, so that when these degrees are so multiplied as to approach very near towards certainty, the difference of the shades becomes imperceptible; thus hope insensibly becomes joy; and fear, sadness.

Accordingly joy and hope are the cheerful attendants on pleasure; sadness and fear, the gloomy attendants on pain.

This

This is the origin of our desires and passions, which on examination appear to be the effect of sentiments inspired by nature, combined with the understanding and the will. It is not however the same with that which has been assigned by a modern philosopher *, celebrated for his extensive knowledge, elegant stile, and love of system. As the authority of this writer is of great weight, and as it might be prejudicial to truth were his opinion to prevail, I will offer such reasons as will probably determine the reader to reject it.

Buffon pretends, that our appetites and passions are wholly physical ; because they

* The situation of an author is extremely unfavourable, who writes upon any subject, after one of these systematical writers, and accompanies all he advances with proofs. As the gardener must first pull up the weeds which over-run the ground, before he attempts to sow or plant it ; he must not only establish his own opinion upon evident proofs, but likewise destroy the opposite one. This necessity is a clog on his genius, interrupts the order of the subject, and makes his work appear languid. Contrary to the practice of those who run after objections, that they may have the pleasure to solve them, I could have wished I might have entirely neglected them, but find I cannot avoid discussing such as naturally rise out of my subject.

naturally

170 ON THE HUMAN SOUL.

naturally arise from our sensations *. To demonstrate the falsity of this argument, we need only distinguish in our sentiments, that part which proceeds from physical, from that which proceeds from moral causes ; let us analyse them again, setting apart that which belongs to the senses ; the remaining part will necessarily belong to the soul.

I have shewn, that whenever any object affects us, there arises in the soul a sentiment of love or hatred for it ; the cause of this has been already pointed out. Although these sentiments are necessarily produced by means of the sensations ; although the soul cannot possibly receive any others ; and although their relations are always the same with regard to the nature and force of these sensations, they are not however their necessary, nor their only effect : for it does not follow, that because the sensation is produced, the sentiment must likewise of necessity be produ-

* As Man is a being compounded of two substances, it is a perpetual sophism among philosophers, who have imperfectly observed the reciprocal influence of these two substances, to attribute to the one what ought to be attributed to the other ; whereas had they thoroughly examined them, their enquiries would have guided them to the truth, and they would not have fallen into this mistake.

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ced; there must also exist in the soul a propensity or aversion to the object. This propensity and this aversion, and the effect of the love of ourselves combined with the understanding, which alone judges of the relations subsisting between the impressions of these objects and our happiness. But when we afford us a convincing proof of this is, that, if the object be corporeal, when the impression produced in the organ has been communicated to the soul, the organ has entirely performed its office, and has no longer any influence; it has yet less when the object is of a mental nature; for in such a case the senses have nothing to do in it. Therefore, the sentiments of love or hatred are only acts of the soul, which perceives the relation of objects to our well-being, and has a consequent propensity or aversion thereon. So that the passions of love and hate have in them something of an higher nature, and are not purely physical.

But to continue our analysis.

Desire has always a sentiment of love for its basis, as aversion has a sentiment of hatred; and since every sentiment has an object, the sensations are therefore absolutely necessary

172 ON THE HUMAN SOUL.

necessary to give birth to desire and aversion, but do not produce them; for, although the sensation be ever so frequently impressed on the soul, desire would never ensue, if the understanding did not discover the relation of objects to us. This is so true, that fools and ideots, who cannot perceive this relation, do not experience the desire accompanying these sensations. Our passions therefore are not merely physical, since they are only strong desires, or strong aversions arising successively in the mind, during a long interval. The concurrence of three things is necessary to give rise to the passions, viz. sensation; the love of pleasure or the hatred of pain; and the judgment of the soul on the relation subsisting between our well-being and the objects which affect us. All the passions are therefore mere emotions of the soul; and it is in this spiritual principle that we must look for the origin of pride, ambition, avarice, and even of those passions which are altogether sensual*.

Of

* We can, by this time, judge of the errors of those philosophers, who have pretended to demonstrate the mechanism of the passions in the modifications impressed

Of the PASSIONS in particular.

Our different sentiments assume different denominations, from their different degrees of force and duration.

When the sentiments of love and hatred, desire and aversion, are violent, and are incessantly renewed during a considerable time, they are denominated *passions*; when they are weak and of short duration, they are termed *likings*.

We divide the passions into *predominant* and *subordinate*. In the latter, our hearts are influenced for a short time by some particular sentiment; in the former, some particular sentiment reigns supreme in the soul, and lords it over every other desire.

What Man could be more voluptuous than *Julius Cæsar*? What Man had a greater number of mistresses? Besides his wives, four of whom he divorced, he intrigued with the queen of Bythinia, *Cleo-*

sed on the fluid of the nerves, founded on some phenomena ill observed, where those writers have constantly taken the effect for the cause. See le *Traité des Sensations, & des Passions* of Le Cat, page 154, Paris edition, 1767.

pa'ra;

174 ON THE HUMAN SOUL.

patra ; *Eunoe*, queen of *Mauritania* ; *Posthumia*, wife of *Servius Sulpitius* ; *Lollia*, wife of *Gabinus* ; *Tertullia*, wife of *Craspus* ; *Mutius*, wife of *Pompey* ; *Servilia*, sister to *Cato*, and with others besides. Pleasure, however, was not his ruling passion. Love, that drew off the attention of *Marc Anthony* from the management of public affairs, never lost *Cæsar* a single moment, nor made him neglect one opportunity of advancing his power. — Ambition was the predominant passion of *Cæsar* * ! Every passion, more or less, influences the actions of men : but as the ruling passion is their leading principle of action, it stamps a general character on their whole conduct. When once it gets possession of the heart, it governs with an absolute sway, continually impelling it to the pursuit of its object, independent of all the subordinate passions which oppose its career.

Every passion is grounded on love or hatred. Sometimes the passions are wholly confined to these sentiments ; at

* *Cæsar*'s extreme desire of being eminent appeared even in the choice of his mistresses.

other times these sentiments are found united with some others; as fear, hope, esteem, contempt, relatively to our situation in respect of the object of our love or hatred, and to the merit of the object with which we compare ourselves. Such is pride, a passion composed of the sentiments of love and esteem for ourselves exclusively: such is anger, a passion compounded of the sentiment of sadness, occasioned by misfortunes, and of hatred for the authors of them.

The simple passions of hatred and love assume different denominations, according to their objects. Love becomes avarice, friendship, lust, ambition; according as it is directed towards riches, a friend, women, honours.

And as every passion has some object, which affects either the senses or the mind, we further distinguish them into sensual and artificial passions.

To the former class belong lust, gluttony, drunkenness; to the latter, vanity, love of glory, and of all those phantoms which opinion esteems blessings, and which self-love so earnestly hankers after.

He

176 ON THE HUMAN SOUL.

He must never have reflected on the objects of the passions, who knows not, that all men of good constitution agree as to the former class of the passions; although in the other they differ widely. All men desire, in a greater or less degree, the pleasures of the table, of the sex, of music, odours, painting; but there are some men entirely without ambition, and others insensible to glory. One chiefly esteems the trifling advantage of beauty, and spends his life in admiring his bodily advantages; another takes a pleasure in displaying his large possessions, and is delighted with the extreme pain he gives those who envy his glory and happiness: another finds charms in an indolent life, or in the silent contemplation of the wonders of nature. Thus all are engrossed by artificial pleasures, and of these, each has some pleasure peculiar to himself.

He must likewise never have reflected on the objects of our different affections, who knows not, that the number of the artificial passions greatly exceeds that of the sensual. The latter are limited to the number of our senses; whereas the former, being the effect of opinion, are infinite;

ON THE HUMAN SOUL 177

nite; for the mind is incessantly active, and ever prone to invent novelties. The senses, as it were, chain us to the earth, whilst the imagination transports us above it, and, being limited by no space, raises us above our equals, and exalts us to angels or Gods.

Refutation of a Sophism of HELVETIUS,

It has been said, that the passions are only the voice of the senses; and a philosopher of the present age has vainly tortured his brain to explain this paradox.

It is certain, that many passions are dependent on the senses, from the nature of their object; and many likewise are, in appearance, continued onwards to the soul by means of some false relations, concerning which, we may easily undeceive ourselves: but how many of the passions are wholly dependent on the mind? And how many of them have only imaginary objects?

The chief happiness in a Roman triumph was no more than the pleasure the victor took in dragging at his car vanquished monarchs loaden with chains, and in

178 ON THE HUMAN SOUL.

displaying to the gazing populace the trophies of his prouess; and the repeated acclamations of the public? The charms of love consist solely in the idea of being beloved by the object of our passion. Sensual love has merely gross enjoyment for its end; but true love is only satisfied with the heart.

Let us leave the sophistical author *de l'Esprit*, to deduce every passion from physical sensibility; but he never can deduce from thence the love of glory, that vain incense which ignorance and wretchedness offer at the shrine of power, valour, and genius, and whereof great minds are so covetous.

To prove this, I will not plead that wit, genius, virtue, and the different ways men pursue to attain glory and fame, are not the paths which lead to fortune; that great talents are almost always the objects of envy; nor that, with the generality of mankind, credit is preferred to desert; that the pleasant companion and flattering parasite, are more caressed than the Man of genius and the Man of virtue. But noble souls, souls eager after glory and fame, the sage and the hero, have been almost always
known

ON THE HUMAN SOUL. 179

known to flourish in poor countries; and if virtue has ever shone forth with lustre, it has been among those nations where they had no rewards, but honours, to bestow. But of those who have run in the career of glory, how many have resisted the temptations of luxury, diminished the number of their wants, instead of pursuing the gratification of the senses, and endeavouring to remove the inconveniencies which are the constant attendants on poverty? The Cynic, who spurned the purple and luxury of kings; who was content with frugal nourishment, and the tattered garb of indigence; who rolled himself in the burning sand during the extreme summer heat, and in snow, during the severe cold in winter; and who threw away his wooden bowl, when he found he could do without it, certainly did not covet those pleasures of the senses he so much despised; all he coveted was to be admired. How many others are there, who, so far from looking for the pleasures of the senses in the admiration and esteem of mankind, have even resigned present gratifications for fame?

180 ON THE HUMAN SOUL.

Heraclitus *, that he might the more entirely dedicate himself to study, resigned his crown to his brother, and devoted himself to an irksome and disagreeable kind of life, which required great regularity and severity of manners, with continual application ; in a word, he abandoned all the pageantry and all the pleasures of empire, to live in solitude and in a rigid frugality. Was his love of the sciences owing to his passion for the gratification of the senses ? What pleasures can the sage propose to himself from reputation, which this monarch did not already enjoy when he wore the diadem ? What advantages could he promise himself, which were not infinitely surpassed by those he voluntarily resigned ?

The son of the tyrant *Miso*, in the same manner renounced his father's crown with all the pleasures of sovereignty, that free from the incumbrance of public cares, he might retire from the world, and indulge himself in meditation and solitude. What charms of physical sensibility are to be found in the austere lives of *Zeno*, *Cato*, *Socrates*, and other great souls of far-

* Tyrant of *Ephesus*.

mer ages, inflamed with the love of glory ? What other want besides that of fame can any one have, who, though possessed of superfluous riches, and though raised to the highest degree of human greatness by the advantages of birth, desires to become learned ? If the Man who is invested with the purple of kings, had not an higher motive than the hope of sensual enjoyments, would he not rather slumber away his life on the throne ? Of what advantage was the public esteem to *Cæsar* ? Or is there a pleasure attendant on virtue and knowledge, which power cannot give ? To what other cause shall we attribute this eagerness after glory which he wished to enjoy after death ? From what motive did *Annibal*, *Alexander*, *Augustus*, *Trajan*, *Charles the Fifth*, *Richelieu*, *Christina*, not content with the glory they possessed as monarchs or as heroes, aspire to that of authors ? Why did they covet to shade their brows with the laurels of genius ? Because they were greedy of honour and delicate in their choice of esteem. Though surrounded with the splendor of a throne, they found they had not yet attained solid glory : and from a persuasion that the success of

182 ON THE HUMAN SOUL.

military achievements and victories which flattery attributed to the general or the king, often depended on circumstances, on the ignorance or cowardice of the enemy; they disdained a reputation they believed they had not deserved; aspired to that glory which is founded on personal merit, and sought it in science. Let us then conclude, that souls which hanker after glory are only inflamed with the love of that which is pure and solid, and covet praise merely for its own sake. But why go back into remote times for proofs of a truth, whereof we have so many shining examples within our own knowledge. What but the love of fame, the desire to hear our names mentioned with honour, and to have them recorded in the annals of history, could have produced, in our own times, so many actions of valour, constancy, and heroism? What but the love of whatever is noble and praiseworthy, which begets in the heart of the wise an inexhaustible fount of delicate sentiments, and enables him to possess, amidst the disorder of the elements and the shock of nature, that serenity which no misfortune can destroy? What but the imagination alone gives us, when

we converse with those to whom we are connected by the endearing ties of friendship, that delicate enjoyment which is conveyed to the heart without any communication with the senses? What but the imagination alone can produce that pleasing languor, which delicate minds experience in the embraces of love, so superior to the transports, enjoyment, and phrenzy of the senses? What Man is so unfavoured by nature, as never to have enjoyed the pleasures of the imagination? What soul so rude and uncultivated as to be insensible to their charms? Even the miser acknowledges their power: and when he gathers the fruit which he has planted and carefully fostered with his own hand, does he not invite his friend, and importune him to eat of it?

*Of comparative Force of the PASSIONS of
the SENSES and MIND.*

Man is not only sensible to the pleasures of the imagination: not only there are some actions which belong not to physical sensibility, but the passions of the imagination may overpower the sensual, and do so very often.

184 ON THE HUMAN SOUL!

Does not the coquette prefer the pleasure of being admired to the pleasure of enjoyment? Does she not rather chuse to excite the passions of her admirers, to possess them with fears, envy, and disquietudes, and to triumph over their ardour, than to receive the tender embraces of a passionate lover?

Soldiers selected by the general to pierce through the battalions of the enemy; proud of the honour of this distinction; rush on the arms of their opponents, confront danger and death, and prefer that glorious occasions of signalizing their valour in fight of the army, to every other consideration.

No sacrifice is too much to purchase glory; the savages of America suffer the most cruel punishments without a groan, without a tear, and fear the torments of body less than the imputation of cowardice. Thus the gladiators at *Rome*, on receiving a mortal wound in the *arena*, viewed the effusion of their blood with a disdainful air; they contended with pain, and were not so much afraid of death, as of the disgrace of uttering a sigh or shedding a single tear; and even in their last agonies

ON THE HUMAN SOUL. 185

agonies they carefully maintained the warlike posture, which they had been taught by the masters in their art.

The image of pleasure is sweet under whatever form it appear. The prospect of a fine country, the coolness of a stream of water in the heat of summer, the harmonious melody of birds, always produce pleasure; the joys of love ever affect the heart with a gentle delirium; yet none but pleasures of imagination fire the heart, ravish the soul, and occasion its transports.

Of the Unfolding of the Powers of the Soul.

Let the soul exist, if any one will have it so, before the body to which it is united; and even in that pre-existent state possess a different mode of perception and understanding; yet is certain that, when it has once become subject to the laws of this union, it no longer retains any of its former ideas, not even the consciousness of its pre-existence.

We distinguish in the soul five faculties, none of which is unfolded at our birth. Our sensibility is not then developed, neither is the understanding, every idea being founded on sensation; the
memory

memory and the will are also undistinguishable; for, to remember objects, they must first have been perceived; and to *will*, we must have perceived, known and remembered them. None of these faculties has a determinate object, not even instinct; for although it is sufficient that it perceive its object, to have a propensity towards it, yet it certainly must have perceived it. The sensitive principle must therefore be first unfolded in the mind; but the sensibility of the soul being a purely passive faculty, it would for ever continue unexerted, if external objects did not produce their impressions by the aid of the senses. Deprive the body of these organs, convert it into an insensible machine, and imagine the soul for ever confined in this machine; that instant, all these faculties are lost, and the soul itself is reduced to a state of insensibility. The sensibility of the soul must therefore receive objects from the senses, before it can receive them from the understanding; hence it is evident, that the soul must first perceive by means of the body, before it is capable of perceiving of itself.

Hence,

ON THE HUMAN SOUL. 187

Hence, though possessed of the faculty of perceiving, judging, recollecting and chusing, the soul could neither perceive, recollect, judge, nor chuse, unless united to an organized and sensible body; it would not even be conscious of its own existence, for it is only by reflecting on its sensations, it acquires this consciousness.

Next after sensibility is unfolded instinct; then memory; after that the understanding, and last of all the will: however singular this gradation may appear, it is however the order observed by nature in the unfolding of our faculties.

With regard to the time when this unfolding is accomplished, it varies with the constitution of each individual; but this variation is inconsiderable. While the infant is in the womb, its organs are not in a state adapted to receive a perfect sensation; besides, in the fluid wherein it is contained, it is incapable of receiving any sensation, not even that of the fluid; just as we perceive not the air when calm, serene, and of equal temperature. But in a few days after birth, its senses are in a state adapted to receive the impression of objects; the sensitive principle then expands,

188 ON THE HUMAN SOUL.

pands, and begins to exert itself. The sensitive faculty is soon succeeded by that of the memory; the understanding presently follows; the infant compares its sensations as soon as it acquires the use of its senses, and in a short time is able to distinguish them. All this is done in about forty days; by this time the infant already knows its nurse. The unfolding of the will immediately succeeds; for it is not long till the infant can distinguish the different objects of its sensations, and know pleasure and pain: from this instant the innate desire of happiness has its determinate object, and the will pursues some known good. Thus all the faculties of Man are rendered active a short time after birth; but there passes a considerable space of time before they are perfectly developed. The infant has at first only particular sensations; objects appear unconnected, and it distinguishes them only by their different sensations: when the number of these sensations are multiplied, the child compares them, perceives their identity or difference, begins to range them in certain classes according to analogy, and to form ideas.

I have

I have distinguished the operations of the understanding into reason and imagination : by the former the soul perceives the real relations of objects ; by the latter, it invents imaginary ones. These different operations require very different qualities in the person who judges. To judge of true relations, it is sufficient to examine objects ; the mind then determines spontaneously : but to invent such relations as are directed to some end *, a great number of things must be first known ; we must then retire within ourselves, and silently combine them in many different ways ; as this requires reflection, it is impracticable in the early part of life, an age entirely engrossed by physical sensibility and by sleep. The imagination cannot therefore be developed very early in life, and a longer space of time still must elapse, before any moral ideas can be acquired.

Every relation perceived between different objects forms an idea ; every idea is an abstract sensation, but every kind of ideas is not equally acquired.

* I here mean regular invention.

190 ON THE HUMAN SOUL.

The first that offer to the mind are those which have for their objects the physical relations of beings; afterwards those which have for their objects moral relations, so difficult for mature age to acquire, and impossible for infancy, although this age give many apparent signs of these ideas *.

Of the Exercise of the Powers of the Soul.

Each of these powers has its separate functions, but they cannot act separately; for, to produce thoughts, desires or passions, they must unite and act in concert. Thus all the powers of the soul act in conjunction, and their operations are produced by their combination.

It is of consequence that the point which separates the operation of the different mental powers be exactly defined, which no one has hitherto done.

Although the unfolding of the faculties of the soul constantly require the assistance of the senses, yet when the sensa-

* When infants are causelessly beaten, or deprived of their toys, it is not from any sentiment of the injustice done them that they cry, but from a painful sensation excited by the blows, from the chagrin of being deprived of the object of their pleasures, and from the loss of their amusements,

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ON THE HUMAN SOUL. 191

tions are once received, these faculties can perfect the whole without their concurrence. Observe those who walk in their sleep: you will see them get out of bed, go backwards and forwards, traverse different apartments, act, stand in a museful attitude, and go about their affairs as when awake. All the powers of the soul are at that time in action, sensibility, instinct, self-love, memory, judgment, will, all but the organs of sense; such persons being without any knowledge of their actual situation, and ignorant of the danger that attends them. During the whole time, the soul seems detached from the body, and man appears an automaton in motion*.

Although the faculty of thinking is inherent in the soul, it nevertheless does not always think. How frequently, in the course of our lives, is the mind entirely engrossed by sensibility, while all its other faculties are suspended? Upon hearing any dreadful news, the blood chills, the

* It may be here observed, that this power of the soul to detach itself from the senses, proves it to be distinct from the body, much better than the unintelligible jargon of metaphysicians,

heart

192 ON THE HUMAN SOUL.

heart violently contracts, reason is extinct, and the soul recoils within itself, and is insensible to every thing but its calamity. In acute pain we have no internal sensation but that of our sufferings. Hence there are moments, when the soul does not think, and these are sometimes sufficiently long. Have you never observed the surprize of a clown, when he first enters the theatre; at the rising of the curtain, struck with the wonders which present themselves to his sight, absorbed by objects so uncommon, and as if he were besides himself in that enchanted place, he never once reflects, but is entirely employed in contemplating the scene, and his whole soul resides in his eyes.

We can likewise suspend the activity of the judgment at pleasure, and leave sensibility to act alone. A lover of harmony, or eloquence, on hearing a beautiful passage, or pathetic description, retires within himself, and is, as it were, concentrated in his sensibility. Does not an enthusiast, in the heat of devotion, sometimes suspend the activity of his judgment, that he may indulge himself in the enjoyment of a temporary sentiment that charms him?

What

ON THE HUMAN SOUL. 193

What man, who has been accustomed to think, is not convinced of this truth from his own experience?

Sensibility may alone occupy the soul entire; the understanding never can: for, to enable the understanding to judge, there must be at least two sensations present in the mind, the subject and the attribute*. The understanding and sensibility are then united into one single act, in all our judgments. Memory is added thereto very often; for the understanding judges equally of past and present sensations.

The memory cannot at any time operate alone; for all things being disposed in this receptacle, are, as it were, in a state of non-existence, till the understanding recalls them to the mind: this faculty there-

* It sometimes happens, that the subject is not a body, as in this proposition, *God is just*; but we never represent a spirit, otherwise than in a corporeal form, or rather, we never represent it at all. The attribute is almost always a sensation, as in those abstract ideas; *warm, hard, great, good, fine*. This is so true, that we cannot form any notion of *extension, gravity, beauty*, and of several other abstract ideas, but by referring Man to his senses. Every idea of this kind is therefore, properly speaking, an abstract sensation.

fore always requires the concurrence of the understanding in its operations.

Finally, as the will is often directed by the understanding, it always requires an object to be supplied by sensibility, or by the memory: it cannot act, unless at least one of these faculties concur.

Of the Exercise of SENSIBILITY.

Sensibility can not only occupy the whole soul, and must not only concur in every operation of the mind, but is incessantly in action. While the soul continues united to the body, it is continually affected with some sensations, some new sentiment, or some sentiment reproduced. We may easily be convinced of this, by observing what passes within ourselves.

The soul may be affected with many different sensations at once; because many senses can be affected, and the same sense may also be affected many ways, at the same time.

The number of these different sensations is very great; neither is it possible to determine where it ends, as it is impossible to fix the number of different objects,

objects, which may act together on the senses; but the number of different sensations, with which the soul may be affected without confusion at the same time, is much more confined. On hearing a very complex musical composition, the ear is affected by every sound of the several instruments, but without being able to distinguish them *. But whatever their number may be, to enable the soul to distinguish the different sensations which affect it at the same time, they must not be very lively; for if, among these sensations, there be one much stronger than the others, it weakens them to such a degree, as nearly to annihilate them, and this with an energy proportioned to its strength. There is likewise in sensations a degree of force which absorbs all our sensibility, as if in these moments the heart could not divide itself. It is thus, whilst in the arms of a beloved mistress, that so many agreeable sensations arise successively; but in

* I have seen in London a young performer on the harpsicord, that could distinguish the different tones of the strings vibrating together, when any one applied the fingers to the keys of the piano forte, or any other instrument of the kind.

that happy moment which is the *aeme* of our pleasures, amidst the delights in which we are lost, the soul is only sensible to the most ecstatic, viz. to the prolific fluid as it is discharged through the numerous circumvolutions of its vessels.

When the soul is absorpt by any strong sensation, it continues in that state until this impression insensibly decaying comes to be perfectly extinct, or until a sensation yet more strong takes place.

The soul cannot be affected by many sentiments at one time, as it is by many sensations; for the senses, which communicate the impressions of objects to the soul are many, whilst the understanding, which discovers their relations, is but one. And it has been proved, that sentiments arise in the soul by the relations which Man perceives between himself and other beings. The senses may likewise be affected many ways at the same time, whilst the understanding can fix on one relation only, as I shall hereafter prove. There is, therefore, at one time, but one sentiment in the soul, although it appear to be affected with a thousand emotions at once. But as this operation of the understanding

derstanding is performed with inconceivable velocity; these sentiments arise, and are succeeded with such rapidity, that it is often impossible to distinguish the infinitely small interval which separates them; whatever attention we may give to what is at that time transacting in the mind.

This is the reason why a thousand sad and agreeable sentiments seem to divide the soul between them, and why we suppose it to be at once distracted with pain, and transported with joy.

However impossible it may be to distinguish, by the internal feeling, the interval separating these rapid emotions, it is more so to distinguish them by their external signs; because the impressions of the sentiments, made on the corporeal organs, are much more durable than those made on the soul. Hence when the soul is successively under the power of impetuous emotions, which rapidly succeed each other, their different impressions on the body continue together. Observe the unhappy father, who conducts his only son to the altar of death; at the very time when the fear of the gods arms his hand, and he applies the knife to the bosom of his child;

198 ON THE HUMAN SOUL

paternal affection suspends the stroke, and he melts into tears.

If the succession of the sentiments of the soul be often imperceptible, it nevertheless may sometimes be perceived. There are but few who are accustomed to examine what passes within them, who have not observed, that often, amidst the agitations of the mind, a sentiment shall arise and destroy that which preceded it; that though the sentiments are successively effaced in a disturbed mind, they yet spring up again instantly after; and lastly, that the soul, unsettled, wavers between its different emotions: just as, in a sea agitated by the winds, we observe the waves break one against the other and instantly re-appear.

In the conflict of the different sentiments with which the soul is successively agitated, as in the concurrence of the sensations, the strongest always weakens the others, destroys them, and reigns alone in the soul.

When the friends of *Pamsey* lamented his defeat after the dreadful slaughter at *Pbarjalia*, seized with fear at the approach of the Egyptian vessels, their grief made them dumb; each one's particular danger prevented

prevented his being concerned for the common misfortune; they thought only of encouraging the sailors, and seeking their safety by flight: as soon as their fears were removed, the loss they had suffered again came into their minds, and they again melted in tears. Thus nothing but extreme pleasure can entirely deliver the soul from profound grief; nor can any thing but intense pain create sadness in an heart overflowing with joy; every weaker affection glances, as it were, on the soul, and makes no lasting impression on it.

But when these sentiments are nearly of equal force, the soul, as if unsettled and wavering between contrary emotions, knows not which to resolve on; its desires destroy each other; scarce is it freed from its troubles, when it is involved in them anew; this indetermined state does not always terminate to the advantage of the most powerful sentiment. After a long conflict, the soul, wearied out with the efforts it has made, gradually loses its sensibility and force together; and finally yields to the last impression, which thus remains master of the field.

200 ON THE HUMAN SOUL.

There is this difference between the succession of sensations and that of sentiments: in the succession of new sensations, only the sensibility of the soul and the organs of sense are in action; but in that of the sentiments, sensibility, understanding and memory, must always concur: for it is the understanding, which, by the assistance of analagous sensations, furnished by the senses or by the memory, gives rise to our sentiments, and occasions their succession. When the sensations which thus succeed each other, instead of being then newly produced, are only renewed, the same faculties are in action as in that of the sentiments.

The duration of sentiments is very long when these emotions are violent, and extremely short when they are weak; but in general their duration is not near so much confined as that of the sensations. Anger and fury are of longer duration than the strongest impressions of objects on our organs*. Avarice, that sordid

* We must not rank as sensations, those which proceed from some disorder in the organs, nor those which are continually produced by new impressions, as the pain occasioned by a wound.

senti-

sentiment which day and night engrosses those base minds which are infected with it, is of yet longer continuance. The same may be said of jealousy, that tyrannical sentiment, and the constant companion of suspicion; which haunts the wretch it has taken possession of, and suggests to him the idea of dishonour though in the embraces of the beloved object of his desires, so that he groans under a load of bitterness even when the senses are laid a sleep.

Of the Exercise of the UNDERSTANDING.

Let us here distinguish exactly what is peculiar to the understanding while in exercise, from that which is peculiar to the other faculties. Thinking is a property of the understanding, but the understanding alone is not sufficient to produce it. The judgment is employed in determining the relations of things, and as we may either judge of absent objects or of those which are present, sensibility and memory therefore are combined with the understanding in forming our judgments, as has been already observed: in these two faculties the understanding perceives objects, in the same manner as

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we behold ourselves in a glass, if I may be allowed to make the comparison.

Our judgments are often formed without our concurrence, and sometimes in spite of our utmost efforts to the contrary; in such cases, the will has no share. But if thought sometimes take place without the concurrence of the will; at other times, the will concurs with sensibility and memory in the exercise of the understanding; for the understanding is a faculty, the exercise whereof we can suspend and govern as we think fit. We can at will, determine the soul to the consideration of external objects, and afterwards turn our thoughts inwards within the mind, in order to compare and combine them in different manners at pleasure, and judge of their relations. The exercise of the understanding is therefore both voluntary and involuntary. I have distinguished two different powers in the understanding: that of perceiving, examining, and comparing objects; and that of judging of their relations. It is the first only of these powers which concurs with the will; for we cannot refrain from judging of any relation which presents itself

self to the mind. If, however, we at times can suspend our judgment, it is by prolonging the exercise of the former of these powers, without which there can be no judgment, and not by employing the other.

The voluntary use of this power constitutes attention; for what is the attentive consideration of any object, but the fixing the exercise of this intellectual faculty on its impression, communicated to the soul by the organs of sense, or preserved by the memory?

As we can perceive a certain number of sensations at once, our attention may be shared among a certain number of objects; but the smaller this number of objects is, *ceteris paribus*, the stronger is the attention, and *vice versa*. This is evident in absence of mind, but much more so in the catalepsy*, a disorder wherein the soul

* The catalepsy is a very uncommon indisposition of the soul. Physicians have hitherto, without reason, taken it for a disease of the body, and have treated it as such. But a more attentive consideration of the phenomena of nature would have convinced them, that it is only a simple affection of the soul; as the
body

soul being entirely ingrossed by intense thought, appears to have no communication with the understanding, and the body is at such a time in perfect health, and regularly performs all its functions. The catalepsy is, properly speaking, but intense thought, wherein attention is carried to the highest possible degree; or, if you will, wherein the soul is violently affected, and, as it were, concentrated within itself. Hence none are subject to the catalepsy but persons of great sensibility, and such as are affected by excessive pleasure or excessive grief, which, as they dare not confide to any one, they are condemned to mourn or rejoice inwardly. Such are hypochondriacs, devotees, enthusiasts, amorous persons, but more especially sedentary women, whose passions are naturally more violent than those of men, and whose inactivity continues the mind intent upon the object which has once got possession of it. We shall be easily convinced of this, if we consider the symptoms which accompany this supposed malady. Of the following case I myself was witness. A woman of a very choleric temperament, and much given to the reading of books of devotion, had all the symptoms which are found united in the most complicated cases: she was subject to frequent wanderings in her discourse, which she would break off abruptly, and become motionless; her eyes remained open and fixed, but she could neither see, hear, nor feel; she felt no pain from punctures in her flesh, and was insensible of the most violent agitations: like a statue of soft wax, her limbs were flexible, and retained any posture in which they were placed by chance or otherwise; her pulse not only continued to beat, but was even quicker than usual, and her complexion

with the body. Undoubtedly the force of attention depends on the number of objects which the understanding considers at once; yet it likewise depends on the force of the will;

plexion likewise was more florid and lively; after continuing in this situation for some time, her body began to move, like a person awaking from a troublesome sleep, fetching many deep sighs; she gradually recovered, but retained no remembrance of what had passed, and with a seeming extasy related her visions. Now wherein does this state differ from that of a studious person, who indulges himself in profound meditation, except in that it is a stronger attention? And are not these the visions of a soul most violently affected?

But some will reply, that a great disorder of the organs of the head has been discovered by dissection in persons who have been subject to the catalepsy. In some, the vessels which pass from the basis of the *cranium* to the *sinus* were distended with thick blood, and the posterior part of this vessel was humid with ferocities; in others, the anterior part of the *arteria* has been found hard, its basis soft and humid, and the principles of the nerves small and dry. But what does this prove? What are these appearances but the natural effects of the violent tension of the muscular fibres, and of the loss of spirits which ever accompanies profound meditation; as I shall hereafter demonstrate? Are not the *stases* of fluids, and the obstruction of vessels, the ordinary effects of that diminution of organical elasticity, which ensues from this violent tension? Is not the extravasation of the serous part of the fluids the

will; for the will is susceptible of different degrees of intenseness, as are the motives determining it. We can at pleasure use efforts more or less violent, to consider an object; we can diminish attention, or augment it to such a degree, that it shall appear entirely to engross the soul.

Some persons, like the priest of *Calamus* *, have the faculty of being so affected at will, as to become insensible of what happens to the body.

The faculty of judging is natural to the soul, but is properly free only when sensible of the necessary consequence of the states? Is it not evident that physicians, in their sagacious researches into the causes of this imaginary disease, have taken the effect for the cause, when they cited these observations? And is it not likewise evident, that the catalepsy is no disease of the body.

A circumstance which yields the most demonstrative evidence, and proves the sound state of the organs of the head in this supposed malady is, that in the loss of knowledge, which succeeds the disorders of this organ (such as the intumescence of the brain and inflammation of its membranes) the soul loses every degree of sense, as in the apoplexy, sycopes, deliquia, but is conscious of its condition in the catalepsy.

* See Augustine de Civitate Dei, Lib. xiv. cap. 24.

sibility is not affected by any object besides those of our judgments: when the sensations are strong, they always disturb the exercise of thinking; when extremely so, they destroy it entirely. In this latter case, there is no judgment; because the mind is entirely engrossed by a new object: in the first case there is, it is true, a judgment, but this is an erroneous one. The new sensations, not having sufficient force entirely to engage the attention, divide it; being thus obliged to employ it on different objects, the mind cannot sufficiently consider those of which it is to judge; so that it confounds them, and forms false and absurd judgments. This is very evident in persons agitated by passions. Amidst their emotions, the soul cannot come to any prudent determination; sometimes it forms a multitude of weak resolutions, and extravagant projects, and is unresolved which to prefer: at other times, full of the object by which it is affected, it confounds every thing in the judgments it makes with this object, and is no longer attentive to reason. This is the cause why profound meditation takes place only when
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208 ON THE HUMAN SOUL:

the passions are calm, in silence and in solitude.

The exercise of the understanding is either restrained or interrupted when sensibility is strongly affected; and, by a very singular phenomenon, when the understanding is closely employed, the impressions of external objects upon the senses appear weakened, sometimes null, as we observe in absent persons *, *in those who walk in their sleep*, and in cataleptics. Hence, if our thoughts be not perfectly free, except when our sensibility is not engrossed by any sensations, besides those which are the objects of our judgments; so neither are the sensations in their full force, except when the understanding is totally inactive. Not that the exercise of this faculty interrupts the commerce of the soul with the body, as some have supposed; the understanding neither adds to, nor takes from the force of these sensations, and they remain perpetually the same; it is because we judge not until the understanding has

* This is the reason why an absent person sometimes looks for his spectacles and has them upon his nose, and why cataleptics have no knowledge of what is acting about them.

considered the objects of which it is to judge; that is, we never judge without employing attention: and because without attention, the impressions of objects on our organs, and even the sensations renewed by the memory are, to the soul, as if they had no existence: it therefore appears, that the soul cannot be attentive to sensations from without, when it is immersed in profound meditation.

There may be many sensations in the soul at one time, but never more than one judgment; the faculty of judging not being divisible like that of perceiving. It is in sensibility, and in the memory that the understanding perceives the objects of its judgments; and the number of these objects may be as great, as that of the different sensations, which the soul can receive at the same time. The mind may very easily perceive all these objects at once, but to judge of their relations, it must compare them, examine them one after another, in some determinate point of view, and reduce them to a fixed standard: now the mind can examine objects, but in one point of view at a time. Thus the understanding can, at the same time,

210 ON THE HUMAN SOUL.

perceive only one of their relations, and there can be only one judgment at a time in the soul.

Natural Succession of the THOUGHTS.

Since the understanding in its operations is combined with the will, the mind can transfer at pleasure its thoughts to different objects, without any connexion of ideas, and form what we may term separate judgments; but this is not the order which the mind pursues in thinking, when left to itself.

When we reflect on the almost imperceptible connexion observable in the succession of our ideas, and observe their dependencies, we evidently perceive, that the mind, in its progress, always proceeds by analogy. When we are alone walking in the fields, if a voice much resembling that of a friend, strike the organ of hearing, or a colour like that of his coat occur to the sight, his image immediately presents itself to the mind, we recollect some peculiar circumstance, and recall some former discourse.

Those analogies, which constitute the association and link of our thoughts, are not

not always perceived ; but they rarely escape us, if we recollect ourselves, and leisurely observe the progress of the understanding. I have frequently entered into an examination of what passed within me, and have, if I may venture the expression, caught the soul in the act, on the relations which formed the association of my ideas. Hence it is evident, that the mind proceeds only by analogies, both when it is wrapt in profound meditation, and when absorbed within itself ; and never appears to rove from thought to thought, nor from one subject to another, however extravagant or unconnected its thoughts may appear ; some relation, either slight or striking, forms the transition, and some analogy perceived, either real or apparent, presents the new object to the mind ; if we except the single instance when the soul, forced from its present thoughts by some violent and sudden sensation, interrupts the succession of ideas, and the progress of the understanding. Thus all our ideas are connected by an immense chain, all the links whereof have some common relation.

In what Manner THOUGHT becomes REASON or IMAGINATION.

I have said that reason judges of the true relations of objects, and that the imagination invents ideal ones.

To judge of the true relations of objects, they must be always present in the mind, and be subject to attentive examination ; but attentive examination is not always necessary to invention ; for in these cases it is sufficient to connect the qualities of one subject to those of another, and to confound them in the same whole. If we attentively follow the progress of the understanding, we shall be convinced, that thought always becomes imagination when it ceases to be reason, and that in the point where the one ends, the other begins. When attention is discontinued, the object which engaged us is no longer fixed ; it therefore changes to the first sensation with which the soul is afterwards affected ; the mind employed on this new object combines it with every thing that offers, as it happens in those indeterminate reveries, into which the soul falls after long meditation, or in those
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gentle dreams which succeed laborious exercise. Hence those extravagant fictions, and phantastic ideas, we have in our dreams.

The object of our thoughts changes with every new sensation which affects the soul; but, for want of the action of external objects on our organs, this sensation is almost continually supplied by the soul itself, led by a secret bias towards the most alluring object. The imagination is therefore directed to its object by the passion, and the nature of its thoughts is determined by that of the sentiment which affects us. Whilst the soul is under the power of any gentle emotion, the mind employs itself in augmenting its pleasures; then retiring within itself, it secretly combines this sentiment with some analogous object, from which it derives similar ideas. These are those pleasing fancies, and flattering delusions, which constitute the chiefest enjoyments and principal happiness of our transitory existence. This is the case in the delirium of love: during its continuance we enjoy a flattering dream; the mind is for ever recalling the object of its passion; it engrosses our whole

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thoughts,

214 ON THE HUMAN SOUL.

thoughts, until some more powerful sensation awaken us from our trance, and bring us back to ourselves whether we would or no *.

I have shewn how judgment becomes reason or imagination, according to the manner in which the mind judges of the relations of objects ; and also how it ceases to judge of their true relations, when attention is discontinued. Hence *the understanding is always subordinate to the will, in reason, as it is likewise sometimes in imagination, and sometimes it is wholly free.*

Farther Observations on the Exercise of the UNDERSTANDING.

Of WISDOM and MADNESS.

Thinking is a power inherent in the mind, but is, in its natural state, without rule, choice, or attention : all our judgments are at this time irregular and incoherent, nor is there any necessary connexion between the subject and the attribute. This is observed during sleep : when the senses are at rest, the mind disports with disse-

* This is the reason why imagination never operates to greater advantage than in silence.

rent objects, and forms, by an assemblage of thoughts and sensations, those wild rambling fictions, which are the usual illusions of the night.

When the understanding continues to operate in Man when awake, in the same manner as when he is asleep, this accidental state thus become permanent, is termed *madness*: but when our judgments are regular, and there is a connexion between the subject and attribute, this order of our thoughts is called *wisdom*. What constitutes the whole of the difference between wisdom and madness is therefore attention, which is always attendant on the latter, but never on the former; for we may indeed think without this disposition of the mind, but cannot reflect. If the child that prattles, and the old man who dotes, are both of them incapable of reasoning, it is not because they have no ideas, as some have imagined, but because they are equally devoid of attention: one has never possessed it, and in the other, it is * decayed.

* The reason of this I shall assign hereafter.

This want of attention, which is the cause of madness, is manifest in those extraordinary persons who extravagante upon one subject only. I have known some discourse with great good sense on all kinds of subjects, one particular topic excepted: in such cases, the mind, engrossed by the object which affects it, loses sight of every other, and taking this object for the subject of its judgments, annexes to it every kind of attribute indiscriminately.

The same phenomenon likewise appears in violent passions, which occasion a kind of momentary madness. Moralists mention another species of madmen; a name which they apply to those whose discourse is unfashionable, and conduct altogether singular; that is, whose madness is out of the common road: in this sense *Democritus*, *Diogenes*, *Heraclitus* were madmen; with others of peculiar modes of thinking and living, in every age.

Of regular THOUGHT, considered relatively to the Degrees of Attention it requires.

The faculty of perceiving, comparing, and examining objects, in conjunction with the will, is the cause of reason and regular

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lar thought*. Regular thought takes different denominations, according to the different degrees of attention the mind requires in forming its judgments, combined with the nature of their objects, and the direction of the exercise of the understanding. It retains the generic appellation of *thought*, when this degree of attention is small, whatever may be the object of our judgments and duration of this exercise. It is called *reflection*, when this degree is more considerable; and *meditation*, when it is extreme.

To reflect, is to think attentively; but reflection differs from thought, in so far, as the latter is applied to every kind of object indiscriminately; whilst the former takes place with regard to absent objects only; that is, with regard to those which are renewed by the memory: for to reflect, is to examine whether our thoughts be true; it is the comparing our judgments with their objects, and ascertaining known relations. Thus, after having applied our soul to the perception of external objects, we retire within ourselves to consider,

* That is, thought directed to some end.

compare,

218 ON THE HUMAN SOUL.

compare, and combine them after various manners.

Meditation has the same objects which reflection has, but it differs therefrom not only in the degree of attention, as I have already observed, but also in the duration of thought: reflection is the assemblage of many thoughts in succession; meditation is a long series of deep reflections.

Regular thought is a painful and irksome state of the mind. If our inward feelings afford not sufficient documents of this, it will be easily proved by what passes within us in consequence of our external actions.

Examine Man during infancy: whilst at liberty, he indifferently follows every path that leads to pleasure, obeys every impression of external objects, amuses himself with exercise, goes, comes, runs, stands still, and acts ever without any purpose, and from no motive whatever; he thinks very little, reflects yet less, and never meditates at all. If at any time he rest, or direct his actions to some end, or if he reason ever so little, it is always by compulsion, because he hears his master's voice, and feels the yoke of necessity. But as soon as he is out of
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the sight of his troublesome guardians, he resumes his character, and thinks no more than just what he cannot help, and then only that he may give full swing to the impulse of the senses: thus a spring compressed regains its elasticity, when the compressing power is removed.

Necessity obliges Man to reflect in infancy; the same cause likewise obliges him to reflect when arrived at maturity. Nothing but the sense of present, and the apprehension of future wants, can impel the mind to reflection. It is the passions which give rise to the productions of genius, and to the wonders of art: without these powerful incentives, the mind would languish in listless indolence; and men, like savages, would spend their lives in a momentary contemplation of the objects surrounding them, or else, in sleep.

But if thought be painful, it is only in proportion to the degree of attention it requires, and to the efforts more or less strong, which are necessary to the knowledge, or to the formation of relations. Thus the study of geometry, of the mathematics, and of every science which requires close attention, are extremely toilsome;

some ; whilst those which require but little application scarcely give any fatigue.

OF PENETRATION, STUPIDITY, SAGACITY, and DULNESS.

From the faculty of judging, combined with the number of our sensations and sentiments, and from the chain of our ideas, results a greater or less aptitude to distinguish the relations of things, denominated *penetration* and *stupidity*.

All objects are naturally unconnected, nor is there any connexion between them perceptible to Man, when first he takes a view of nature, even supposing all his faculties to be perfect : the admirable chain connecting every part, is evident to him only, who has compared a multiplicity of things in many different ways ; in short, is only discernible by a philosopher. But as the knowledge of a single relation requires a great number of sensations, it is very evident, that the man who possesses but a few, must necessarily be stupid, and that his apprehension must be the more acute, in proportion as their number is greater.

Supposing

Supposing Man without sensations, and at the same time endued with the faculty of thinking, he must necessarily be stupid; he must likewise be stupid, with the faculty of thinking, and tho' he have many sensations and ideas deposited in the memory, if he be destitute of the power to recall them. It is the understanding only which, by the aid of analogy, recalls our sensations and ideas; but their reproduction, which takes place in the natural succession of our ideas, being without relation to any fixed design, conduces nothing to penetration. No sensation, sentiment, or idea, transmitted to the memory, has any effect, if the power of recalling those which are necessary to discover the relation we desire to know be wanting. Penetration therefore depends on the power of recalling those sensations and ideas which are analogous and correspond with each other.

Penetration, combined with the time which the mind requires for discovering the relations of objects, becomes either *sagacity* or *dulness*. Sagacity, when the time is extremely short*; dulness, when very long.

* Sallies of will, which are signs of sagacity, arise from the rapidity with which the mind forms an analogy.

Saga-

222 ON THE HUMAN SOUL.

Sagacity depends on the choice which the understanding makes of sensations and thoughts; and on the order in which it arranges them in the memory. The greater analogy these sensations and these thoughts have to the relations sought, the more easily the mind discovers these relations.

A mind, sagacious in the smallest degree, easily solves certain abstract questions, with which it has been conversant for some time. It is surprizing to think how readily it gives the solution of them, notwithstanding the numberless obstacles which oppose its progress: on the contrary, if you propose, to a genius of the first class, a question, which may be solved with little difficulty, and about which he has been little conversant, he will hesitate like a very dunce.

Newton, whose sagacious mind soared to heaven with a bold and rapid flight, and discovered the system of the universe, was as ignorant in religious matters as any among the vulgar; and it is certain, that they who apply themselves to the study of enigmas, unravel them much more readily than the most subtil philosophers.

Some

Some singular Phenomena explained, concerning the Effects of the Passions on the UNDERSTANDING.

How different is the prospect of nature, according to the different sentiments which affect us!

In the horror of despair, rage and ferocity are accounted heroism. In the fury occasioned by slighted love, we look on every woman as perfidious; if a mistress prove false to us, from her we estimate the whole sex; then, all the sex are slaves to vanity and self-interest. In the gloomy paroxysms of jealousy, a rival appears in colours much less amiable in our sight, than when our heart was free from that illiberal passion. How frequently does terror conceal the object which caused our fears!

A man, when agitated by any passion, sees not objects, or if he sees them, it is not in the same light as when he was free from their influence; but what is most singular, in the same passion, we always see objects in the same manner. Does the soul overflow with joy? We find charms unknown before in every object near us;

224 ON THE HUMAN SOUL.

us; they change their nature in our eyes, and become more pleasing and more beautiful than before.

The garden where the disgraced courtier endeavoured to forget his cares, on receiving the news of his recal, seems the haunt of some beneficent being, who has drawn aside the veil, which before concealed its beauties from his sight; the flowers appear of a richer hue, their forms seem more agreeable, and their odours more delicious; the air is embalmed, an universal change succeeds, and all is full of grace and beauty.

Is the soul affected with sadness? Nature is covered with a gloomy veil; its deformity is enhanced, and all its beauty fades.

Whatever sentiment may affect us, the cozenage of the passions always subsists, the face of nature is perpetually changing in our eyes. If we love, the object of our passion acquires additional charms. Observe an ardent lover, let the person of his mistress be ever so homely, every part is beautiful, charming, divine! The black is a sprightly brunette. The gigantic a majestic; the meagre a delicate beauty. And if his passion be extreme, this homely,

ly, brown, gaunt, meager creature, ceases to be a woman ; she becomes an angel.

When hatred on the contrary takes possession of the heart, the object of our indignation becomes disagreeable ; and our enemy, whatever merit he possesses, is then ill favoured and odious. And even the objects formerly our delight are altered and disfigured by it. When the slighted lover, who imagined his mistress an angel while his affection continued in its force, ceases to love, the illusion instantly vanishes, and the sight of the lovely face, which before excited so many pleasing emotions, now produces a very opposite effect : his mind being restored to its former state, views with astonishment the former object of his love, and is surprized how he could fix his affections on such features. He asks himself how he could possibly admire her ; and all those bewitching charms, all those heavenly graces are either not seen, or seen with indifference. But if hatred succeeds, the object changes yet more, the few beauties that remained are obscured, elegance becomes deformity, and by a kind of prodigy, hatred degrades an object as much as love exalts it. Such in general

226 ON THE HUMAN SOUL.

are the delusions of the passions; were I to repeat their many species, I should never have done.

The prospect of nature ever varies with the passion, and always in the same proportion: if this change gradually, that also varies insensibly; if this change is instantaneous, the other is altered with the swiftness of lightning. Thus the sentiment we are possessed with, constantly changes the face of nature; like a magician, passion extends its delusive enchantments to every object, and never suffers us to view them but through a false perspective. Whence arises this phenomenon? And what is this hidden charm, which the passions spread over all nature? Wherefore does love embellish, and hatred disfigure its objects?

Of the authors who have attempted to account for these phenomena, some attribute it to the imagination; others to the senses.

The former say, "That in love, for
 " instance, the imagination represents to
 " us those images which are analogous to
 " the sentiment in the mind; that the
 " passionate lover, while his passion con-
 " tinues,

“ tinues, sees not in his mistress her true
 “ image, but a creature of the fancy, and
 “ takes the beauty, which he himself
 “ stamps thereon, to be really that of the
 “ object.” But if we carefully examine
 what passes in our minds at that time, we
 shall be convinced, that this illusion is not
 the effect of the cause to which it is here
 attributed; and should this internal feel-
 ing not convince us, it would be very easy
 to satisfy ourselves thereof, by exa-
 mining facts.

The colourings which the passions com-
 municate to objects, always change as the
 passions: if the passion changes by de-
 grees, these colourings vary insensibly: if
 the passions are instantaneously altered,
 the colourings change with equal rapidity.
 The same cause which produced the illu-
 sion in this latter case, is that which pro-
 duced it in all the other cases. It is there-
 fore clear, that in this sudden change, the
 illusion is not the effect of imagination,
 since no idea has entered the soul whilst
 the change is making; the understanding
 has not even time to act, nor the imagi-
 nation to form any picture.

They who attribute these phenomena to an alteration in the senses, occasioned by the emotions of the mind, rest on no better grounds; for objects continue always the same, they in like manner always produce on our organs similar impressions, and these impressions are communicated to the soul always in the same manner. Neither do the senses undergo any change, and their organic constitution is always the same. It is therefore evident, that these phenomena neither have their cause in the organ which receives this impression, nor in the organ which propagates it; but only in the soul which receives it.

The colourings, which the same passion communicates to objects, are always the same in all cases; and whether the passion change by imperceptible degrees or instantaneously, the colourings change in the same manner; the passion and the illusion decay one after the other by the same gradations. Hence, since objects are ever the same, and since the same object changes with the sentiment in the mind, these phenomena are to be imputed to the passion only. It is love only, therefore,
which

which decks out the idol of our hearts, and lends it its charms without our perceiving it.

But what is the cause of this deceitful charm, which passion communicates to objects? If we attentively consider the matter, we shall discover the simple and evident cause of this surprising phenomenon to be in the sentiment we then entertain.

It is evident, that the soul sees not external objects out of the body; it does not even see them in the organs of the senses, but in itself; and there the prospect of nature is seen *.

Whatever sentiment affects the mind, the illusion of the passions almost continually embellishes or deforms objects, and increases or diminishes their impressions. On the other hand, the impressions of objects are confined to the producing agreeable or painful sensations † of dif-

P 3 ferent

* See Book I. Art. of the body, considered as the general organ of sense and motion.

† The same may be said with regard to the ideas of objects: all these relations or attributes *fine, good, pretty, amiable, charming, noble, heroic, ugly, frightful, mean,*

ferent kinds, all of them in different degrees, but for ever retaining these two characteristics. These sensations are continually exciting in the soul; the one, sentiments of joy, the other, sentiments of grief.

Thus the sentiment which possesses the soul whilst under the influence of any passion, and that which arises from the impression of objects, being analogous, the sentiment resulting from their union must be stronger than either of them singly, and stronger in proportion to the strength of the passion, and to the number of analogous sensations. But observe, that in every new sensation, this compound sentiment is wholly felt, and the soul then supposes it to be the effect of a simple sensation: the understanding, supposing that to be a particular effect, which is the effect of several causes, attributes to the impression of objects that which should only be attributed to the disposi-

mean, wicked, are only so many agreeable or disagreeable ideas. A lover thinks no woman handsome or amiable, but as she resembles his mistress; this conformity is the most agreeable quality another can possess in his estimation.

tion

tion of the soul. It is thus that passion embellishes, deforms, magnifies, and alters objects, and communicates its colourings to every thing in nature. Let us endeavour to render this truth more evident, by applying it to some example.

In every passion some strong sentiment prevails in the soul; in happy love, for instance, joy predominates. If, whilst engrossed by this pleasing sentiment, the soul be affected by any agreeable sensations besides; the pleasure arising from them, is always accompanied with the internal sentiment which then occupies us; thus augmented, the pleasure appears more strong, and the sensations more agreeable. In the self-same manner, joy, whilst the soul is affected with love, communicates its pleasing influence to the impressions of the senses; thus too it embellishes its object, and lends it new charms. Hence in a state of convalescence, the joy of having recovered a good we had lost, gives the country a more pleasing appearance, and renders the view of it more affecting, than when we are in health. The soul, for a long time oppressed by a violent disease, expands upon

232 ON THE HUMAN SOUL.

the return of health, and gives a loose to the pleasing prospect of prolonged existence; and hence arises that delightful sentiment, which produces the agreeable emotion we then feel at the prospect of nature*.

If the sentiment, which predominates in the soul during the continuance of a passion, renders more strong the impression of those objects, which are analogous to it, it must needs impair that of objects which are of a contrary kind. Hence it is, why in sadness nature appears covered with a gloomy veil, and is less agreeable to the sight. This is the cause why jealousy diminishes the merit of a rival, and why hatred disfigures objects as much as love adorns them†.

Although the sentiments, which proceed from the passions and sensations, be reciprocally

* This likewise is the cause why a favour, received from the hand of a tender friend, is more agreeable than when received from the hand of a stranger; and, in a word, why presents receive such additional value from the donor.

† Such likewise is the cause of those frequent alterations in our appetite for different meats, odours, and modes, so erroneously attributed to habit.

cally

cally impaired, when they are of an opposite nature, yet they do not destroy each other but when they are nearly of equal force; otherwise, the contest terminates always to the advantage of the stronger. Thus when hatred is weak, we allow our enemy some small share of merit, and likewise in slight pains, we sometimes yield to the impulse of pleasure, and when grief is not excessive, a smile will sometimes escape us.

Although the sentiments, resulting from passions and the impressions of external objects, be more lively when the passions and impressions are analogous, and weaker, when the reverse; they are only so, when moderate; for when either is extremely violent, their respective sentiment absorbs all attention, and reigns alone in the soul. This is the cause of that blindness observed in persons strongly affected with any passion: and this is the reason why terror oftentimes conceals the object which occasioned it; why joy makes no impression on a soul overwhelmed with sadness, and why grief finds no admittance into a heart which is always engrossed by joy.

Passion

234 ON THE HUMAN SOUL.

Passion frequently renders us blind, deaf, insensible, and objects continually receive their colourings from the disposition of the soul; but there is something yet more surprizing in the illusion of the passions, for they can make us even see objects which do not exist. Fear sometimes produces singular deceptions of the sight: it is fear which represents to the credulous, the dead rising from their tombs; which, to the benighted traveller, who wanders through solitary woods, transforms trees into men, sets before his eyes, in the thickest darkness, ghosts and goblins, and makes him imagine he hears the groans of persons in the agonies of death.

In a fit of enthusiasm, they who are said to be inspired, at times, enjoy heavenly visions, they converse with houris and angels, whilst a thousand phantastic beings are seen by them as clearly as if they really existed.

This phenomenon has long perplexed philosophers, nor have they succeeded better in their explanation of this, than of the preceding; they pretend, that “the nervous fluid in this case commands
“ the

“ the soul, and that, particularly in the
 “ organ of sight, it successively takes all
 “ the modifications, representative of ob-
 “ jects by which it has formerly been af-
 “ fected.” I would willingly know on
 what they built this strange opinion. By
 what means are they assured that the fluid
 of the nerves communicates to the soul
 the image of objects, without the con-
 currence of the objects themselves? Is not
 this a mere supposition? But these philo-
 sophers discover the marvellous in things,
 which are in themselves the most simple.
 This phenomenon, which is so singular
 when these visions are taken for the effect
 of the impressions of the senses on the
 soul, ceases to be so when we consider that
 the prospect of nature is in the soul. We
 must neither seek, out of ourselves, nor in
 the organs of sense, but in the soul it-
 self, for those monstrous images, those
 spectres, and phantoms, which the an-
 cients fancied to be departed souls or
 ghosts, escaped from *Acheron*, and which
 modern philosophers look upon as sensa-
 tions, reproduced on the senses by the fluid
 of the nerves.

Whilst

236 ON THE HUMAN SOUL

Whilst preyed on by any violent passion we may, indeed, direct our sight towards the objects which surround us, but we do not perceive them *, or rather we are altogether unconscious of their impressions. Full of the present sentiment, the soul is engrossed by one object, and is inattentive to every other; it cannot then oppose truth to error, and illusion is inevitable; for it is only by the attention we give to objects, that we can distinguish in the soul their real impressions from their images reproduced, which the understanding then presents to us and associates with them. This is the reason why, in extreme terror, man cannot compare his sensations with the objects which surround him, nor recollect the circumstances, according to which his apprehensions may be either real or imaginary. Incapable of considering whether these objects be real or only ideal, he takes the illusory images which present themselves to the mind for objects really existing. Thus sleep lends to the phantasms of a dream all the characteristics of reality: whilst the senses are at rest, and attention is suspended, the images of the objects

* This happens in the catalepsy.

which

which have formerly affected us, are re-traced in the mind, and that with so great exactness, that we frequently imagine we see and hear those who have been long dead. In the same manner we fancy we see the sun in his meridian lustre, surrounded with thick darkness. And in the still silence of the night we imagine we hear sounds, and that we are transported to a different climate. Thus the lover believes he sees the mistress of his affections, that he hears her charming voice, and that he clasps her in his arms; sometimes his dream changes, and the dear object of his desires vanishes and deludes his eager embraces. And many times the ideal scene is so strongly painted, that we undergo violent agitations, stretch out our arms, rise from our beds, and pursue the empty visions, till awaking, we recover our senses, and are sorry to find ourselves undeceived.

Such are the true causes of those singular phenomena which have baffled philosophers, and which no one as yet has been able to account for.

Of

238 ON THE HUMAN SOUL:

Of the Exercise of the MEMORY.

The soul may be affected at the same time with many sensations, and never but with one idea; but what an immense number of sensations, sentiments, and ideas, are retained at once in the memory!

As the memory is a merely passive faculty, all those sensations, ideas, and sentiments, which are deposited in this magazine, are as if non-existent, till the understanding present them to the mind. Without this intellectual power, the memory would be wholly useless, our thoughts being always effaced one by the other, the fruit of our experience would be lost to us; and the past, for ever obliterated by the present, would be as if it had never been.

We can indeed chuse the object we would deposit in the memory, by applying the soul to it with attention; but we cannot modify any thing deposited in the memory, nor exclude that which is once admitted there.

I have demonstrated how this faculty, combined with sensibility, understanding and will, becomes *recollection* and *remembrance*;

brance ; I shall not here repeat what I have said elsewhere upon this subject, but confine myself to observations of a different kind.

The exercise of the memory depends on the understanding ; these two faculties in this respect are subject to the same laws. It is only by the aid of some relations between the present sensations or ideas, and those which are past, that the latter are retraced in the mind. In a delirium, in folly, in dreams, where all things appear unconnected, and disordered, the renewing of our sensations or ideas is perfected only by the means of analogy, just as when we are awake, although their connection be not perceived ; for whatever objects we recollect, they have always some relation to subsequent or preceding objects.

Sensations and sentiments are always more active in the instant when we receive them, than when renewed by the memory ; hence the strength of the passions is augmented by the presence of their object.

When Coriolanus, with an heart full of resentment, marched against his country, no obstacle could restrain him : threats
and

and intreaties were in vain ; he sat down to besiege Rome. The sight of his native city, recalled the idea of the wrongs his fellow citizens had done him, and gave it new vigor : his fury was inflamed, so that he breathed nothing but revenge, and was on the point of carrying fire and sword into the bowels of his country. Whilst these emotions prevailed, his mother, wife, and children, presented themselves before him in tears ; the sight of these dear objects instantly awakened in his heart the sentiments of tenderness, which before had given place to revenge ; his firmness relented ; all sentiments of hatred became extinguished, and the cruel pleasure of revenge was succeeded by the love of his family, his friends, his country, and his Gods.

A thousand other examples of this kind, equally convincing, might be adduced : the man who has long lived in adversity, if fortune suddenly become propitious, on hearing the happy change in his condition, can hardly restrain his joy ; and during all the while that he is detained from the possession of his treasure, his imagination is continually occupied

ON THE HUMAN SOUL. 241

piéd with the pleasures he promises himself; he enjoys no rest, no quiet: observe how his eyes glisten at the sight of the sacred metal; transported with joy, the emotions affecting him can no longer be confined within the soul; but notwithstanding all his efforts to suppress them, they break out in quick and sudden motions.

In like manner, in a criminal condemned to die, fear continually increases his terror, gathers strength as the hours elapse, and the fatal instant approaches: brought to the place where he is to suffer, he shakes with horror at the sight of what he is to undergo, his blood congeals in the vessels, and his strength fails him with excess of fear.

The passions derive additional force from the presence of their object. It is by a consequence of this law that so many projects expire in their birth, that so many secret resolutions prove abortive, and that we refrain from all freedom of discourse when the tyrant appears. It is this law which augments the trouble of a guilty mind, as well as the inward satisfaction of a truly peni-

242 ON THE HUMAN SOUL.

tent heart, as they approach the great day of account.

Hence the impressions of objects, which are so strong when first received, being transmitted to the memory, gradually decay in proportion to the interval between the time when they are first received, and that when they are recollected. Time, which destroys every thing, seems to exercise the same power on our souls: our sensations, sentiments, ideas, like characters engraven on marble, gradually wear out, and at last are wholly obliterated.

Of the Exercise of the WILL.

We can fix our sensibility on any object; we can select those we will to deposit in the memory, and apply the understanding to the consideration of any of these at pleasure: these faculties of the soul are therefore in this respect dependent on the will.

The same laws appear in the regular exercise of the faculties which are observed in the voluntary and mechanic motions of the body; the soul can employ them in any determinate design, can attend at pleasure

to

ON THE HUMAN SOUL. 243

to any particular object of its choice, and requires only a simple determination of the will to continue this attention. Sensibility, memory and understanding, in certain respects are dependent on the will, but this in its turn is also subject to sensibility. Examine the will in any relation you please, you will ever find it to be directed by sentiment, by the love of pleasure and aversion to pain, even when it appears to seek this, and to renounce the other.

The love of happiness, is what makes the unfortunate feel the vanity of this life, arms his hand with the instrument of fury, and turns it against himself. The same cause excites the fanatic and devotee to fastings, mortifications and self-denial of every kind : from this proceeds that holy rage, which makes them shed their own blood, and expire in the agonies of self-inflicted torments.

All our faculties are therefore differently connected, the one with the other. Sensibility, always subject to the impression of external objects, is sometimes influenced by the will. Memory has for its basis the sensations and ideas, and never appears

244. ON THE HUMAN SOUL.

without the aid of sensibility and of the understanding. The understanding continually requires the concurrence of sensibility, of memory, and frequently of the will. The will likewise is itself subject to sentiment. Such is the connexion of our intellectual faculties, a most admirable connexion, whereby these different powers unite in the same operations, in a manner so gentle, so imperceptible, as to require a considerable degree of ingenuity to perceive it.

Particular OBSERVATIONS *on the* SENSATIONS.

I have observed, that there may be many moderate sensations in the soul at one time, but never more than one extremely powerful sensation. The force of the latter must therefore be much greater than the force of the others combined. This is not because their multiplicity impairs the sensitive principle, and that they really acquire force, in proportion as their number is diminished; but because a very strong sensation occupies the whole soul, and wholly engages its attention; at that time
the

the others are of no effect ; they undoubtedly are transmitted to the soul, but are no longer admissible there. Hence the less sensibility is divided between different sensations, the greater is the force of each particular sensation. The sensations, therefore, must be unconnected, to retain their full power.

It is not so with the sentiments of joy and sadness, which are produced in the soul by these sensations. In the concurrence of analogous sensations, which together affect the soul, their union produces the most powerful effects ; for the second object which the soul discovers, adds to the pleasure produced by the first, and this pleasure is yet farther increased, by the charms of the next new object which succeeds it. The more these sensations are multiplied, the sentiment formed from their combination must be the more strong, the soul being at once affected in many different parts.

A tempest strikes the spectator with horror, but this horror is much increased, if the atmosphere appear on fire, if the winds are in their fury,

246 ON THE HUMAN SOUL.

ry, and peals of thunder shake heaven's concave.

The prospect of a fine country, illumined by the setting sun, and gilded with his departing rays in the evening of a serene day, imparts joy to the soul; the coolness of the air, the delightful melody of birds, the murmurs of some gentle stream, the odours of flowers and easy motion of the fanning zephyrs, enhance the pleasure of the scene, and wholly engage the heart.

In the pleasing, as in the terrible, the concurrence of analogous sensations compose all that is great and magnificent in the scene, and the irregular assemblage of pleasing and frightful objects, together with the variegation of the whole, forms an engaging prospect, which charms the heart or terrifies the soul by means of the senses.

We have seen that different sensations must be unconnected to produce their full effect; but by a singular phenomenon, the united force of the analogous sensations, which affect the soul at the same time, is incomparably greater, than that of the same sensations when they act singly. In the

the enchanting prospect of a fine landscape at sun-rising, not only every new object, every new sensation, adds to the pleasure produced by the others; but what is more to be admired, every sensation becomes more intense, and every object is embellished with the charms of that which succeeds it; the odours of flowers renders their colour more agreeable, and the sweet breath of zephyr adds harmony to the warbling of the birds. Each of these sensations therefore acquire force by their union and mutual concurrence. The cause of this phenomenon is very simple; for to the pleasure produced by one, is united that of the others. The sentiment of pleasure, formed from these particular sentiments, must then be more powerful, and the impression of the sensation more efficacious, as I have proved elsewhere. Analogous sensations therefore gain by their union, as much as contrary sensations lose thereby. Hence the reason why wine is more pleasing, if, besides its flavour, it be of a brilliant colour, and yet more agreeable, if drank out of a vessel of chrystal than if out of a vessel of stone. This is the cause why, in those places of

248 ON THE HUMAN SOUL.

public entertainment where people go to kill time, the want of proper decorations renders the performance less interesting; and why a dress, which has been long in wear, degrades the merit of an actor, and lessens the enjoyment arising from the representation.

Of the Force of the PASSIONS.

The source of every passion is the love of self, and this sentiment is of equal force in every individual; for nothing can be conceived superior to that love which every one entertains for himself: this sentiment has likewise the same degree of force in every individual; as Man never prefers another to himself. The passions, however, are not of equal force in every person; as they derive not their power from their source, but from sensibility; by which both pleasure and pain is estimated. If it be a law of nature to love that which is beneficial, and to hate that which is hurtful to us, it is likewise a law of nature to love or hate objects, in proportion to the good or ill they do us. The force of the passions is then proportionate, in every individual, to his sensibility: but that is not the only cause of their differ-

difference ; their force varies likewise with the nature of their objects.

Every passion is a consuming fire which carries its heat into the soul, and animates it with new vigour ; but all the energy and power of the soul is owing to the artificial passions only. That voluptuous emotion which renders one sex necessary to the other, is gentle * and moderate in the state of nature, that is, when imagination is excluded ; the lustful ardour, which renders that harmless animal, the stag, furious, is not perceived in Man. Is the body over-charged with prolific fluid ? Man feels the impulse of nature, and yields to its suggestions with delight, but is never furious. It is only, when considerations of a kind entirely different from his physical construction happen to be added to this impulse, and when the imagination, finding in the object those ideas of beauty and merit which are of our own creating, magnifies the allurements thereof, makes us believe our sovereign

* Let us not confound love in the state of nature, with that artificial love wherein the senses are inflamed by the imagination, although the heart be not determined exclusively towards any particular object.

250 ON THE HUMAN SOUL.

good depends on the possession of it, and by this means turns the gentle sentiment of love into an immoderate passion. Like a devouring fire, it incessantly preys on him who is inspired with it, and makes him endure all sorts of hardships, encounter every danger, and even spill his blood for its gratification: so that this terrible passion, when in its fury, seems rather calculated to destroy, than to preserve the human species.

The other sensual passions are not more violent than love, in the state of nature; as they may then easily be curbed, they put us to little trouble for their gratification*: whilst the most astonishing effects have been produced by the artificial passions in all ages. It was the love of glory,

* Neither let us confound the fear of death, which ever accompanies the want of aliments, with the pleasure of satisfying hunger. This pleasure could not induce a man to suffer the slightest pain, or expose himself to the least danger; the fear of death, on the contrary, exposes him frequently to a thousand dangers with a view to avoid it. In any public calamity, as in a siege where famine prevails, there is nothing the besieged would not freely give to procure bread; they would even be happy to purchase it at the price of all they have in the world.

which

which produced those ancient heroes, whose actions so greatly astonish us, *Alexander, Cæsar, Gengiscan*. It was the love of glory that made those yet more wonderful men, *Thales, Zeno, Socrates*, sacrifice all the pleasures of life, and pass their days in the painful exercise of the most austere duties, continually exercising their souls by self-denial, thus keeping them always prepared for the strokes of adverse fortune.

It was the *Amor Patriæ*, that instigated the *Decii*, the *Curii*, the *Posthumii*, to devote themselves for its preservation. It was this love which prompted the pacific and just *Aristides*, to a very uncommon instance of moderation: made him respect the liberty of his ungrateful country-men, when it was in his power to have enslaved them, and be contented with the condition of a private citizen, when he might have been master of the commonwealth; for this, he continually governed himself by the laws of rigid virtue, and preserved, through the course of his life, a mind unsullied by the consciousness of an ill action. To the same love is to be attributed the incorruptible virtue of *Cato*, that image of the
 gods,

252 ON THE HUMAN SOUL.

gods, declared enemy of tyranny, and guardian of his country, who undertook the cause of expiring liberty after the death of *Pompey*, revived the drooping spirits of the people, made them take up arms, applied to the remotest parts for assistance, traversed frightful deserts, despising danger, fatigue, singly supporting the whole burden of a civil war, not to purchase a kingdom, but from his ruling passion, the source of all his actions, the love of his country and of liberty, ever regardless of his own interest, and watchful for that of the public. Yet this invincible spirit fell a victim to grief, when he perceived his efforts to be vain, and when he found grief too slow to destroy him, had recourse to his sword, stabbed himself, and tore out his bowels, that he might not be the sad witness of his country's slavery.

The artificial passions produced all those great actions, whose splendor dazzles our imperfect sight, and all those great personages, whose astonishing actions appear fabulous to us, in these times when virtue is no longer in its ancient esteem.

Of

Of the Combination of the PASSIONS.

Every passion is founded on the love of pleasure, and hatred of pain, two sentiments which are common to all men; the same soul is therefore susceptible of every passion indiscriminately, yet they all cannot prevail in it at once, and some passions exclude others, and *vice versa*: thus avarice excludes love of pomp, as the love of glory excludes that of rest.

There is never more than one passion predominant in the soul, at the same time, though it is frequently distracted by many different passions: but the greater the number of these passions is *, the less is the force of any particular one. Not that the sensibility of the soul is divided by their multiplicity, for each one, acting separately, occupies the soul entire; but as these passions act in succession, no one of them has time to make any strong impression thereon. It is the imagination which adorns the idol of our hearts, and is continually setting it off with new charms; by degrees its beauties are

* This must be understood of the artificial passions only.

254 ON THE HUMAN SOUL.

improved to such a degree, as to dazzle and bewitch the mind, and we foolishly adore the work of our own hands, pant after the possession of this phantom, and waste a considerable part of life in the pursuit of it.

Desire is formed in the soul, as soon as the understanding has perceived the relations between the possession of an object and our happiness; but it decays not immediately after its formation; it even continues a while, without disordering the ordinary course of our thoughts.

Our desires are reciprocally combined in different manners, according to their analogy and diversity. The passions, which result from objects which are unconnected, act in succession; the mind passes from one to another, however imperceptible this transition may be, and is then divided between contrary emotions, so that this action is weakened thereby.

Of this nature is the pain a lover feels, on quitting his mistress to join the army and engage in war: such as the poet represents the departure of *Achilles* from *Deidamia*, to the siege of *Troy*: agitated by contrary emotions, his soul long wa-
vers

ON THE HUMAN SOUL. 255

vers betwixt love and glory; he goes at last, but not without grief, and in a manner which evidently demonstrates his irresolution.

Contrary passions arising in the mind reciprocally weaken each other. Thus in questions about matters incapable of demonstration, and merely probable, the certainty of the mind is less when the understanding is divided by contrary ideas. But in the succession of analogous passions, the succeeding sentiment acts in concurrence with that which is already acting on the heart, and their united force communicates a double impression to the soul.

Whilst Rome, yet free, could boast she had within her walls citizens, who had enriched themselves with the spoils of vanquished nations, the love of liberty and glory, together with the desire of preserving the wealth they had acquired, was the source of the superior courage of that people *.

* When the profession of a soldier was the exclusive right of a common citizen, the rich soldiers always distinguished themselves the most, as the dangers they were obliged to undergo were greater than that of others: in a word, the risk of life was common, that of goods particular.

What

256 ON THE HUMAN SOUL.

What a triumph for a young Spartan to be at once the object of public honours, and of the desires of beauty ! How irresistible the love of glory (that powerful and delicate sentiment, which unites the love of grandeur and sublimity, with all the energy of pride) when increased by the allurements of pleasure.

The force of the passions, ever proportionate to the degree of sensibility, is therefore increased by the union of analogous passions, and the more so, in proportion to the number of those sentiments which are collected into one. Thus a torrent, whose waters flow with a gentle motion, whilst divided into many streams, when united in the same channel, rushes with the greatest impetuosity ; so that neither dams, nor rocks, nor banks, can stop its fury.

Of the Duration of the PASSIONS.

If we distinguish the emotions of the soul by their duration, we shall find, that all the sensual passions are of a momentary nature, and, on the contrary, all the artificial passions lasting.

When

ON THE HUMAN SOUL. 257

When love is no more than the voluptuous emotion which inclines one sex to the other, it is periodical, and is felt only when the body is overcharged with prolific fluid: Man therefore waits the impulse of nature ere he resigns himself thereto; his want satisfied, he has no longer desire, and love is extinct. The duration of pleasure can only subsist in the imagination; not in the senses, however ardent those of lovers may be. During their short delirium, their greedy eyes, and impatient hands, know not which charm to select; in the moment of enjoyment they eagerly clasp the object of their desires, and in an universal tremor, impress the most passionate kisses: at the approach of that delicious sensation, the summit of pleasure, their transports, how greatly increased! Their embraces how furious! Over-powered with excessive pleasure, their souls meet on their eager lips, and press each other, as if they would grow together. But the moment the prolific fluid is ejected, the fire which before consumed them is extinguished, until, recalled to pleasure by new desires, again they kindle, again love overwhelms the soul: after a few paroxysms

VOL. I.

R

of

258 ON THE HUMAN SOUL.

of this paradisaic delirium, and a few moments enjoyed in fluttering from flower to flower, a frigid languor succeeds, and the happy pair, now without passion and without desires, sigh for repose, and are eager to part.

How different is the case when the imagination lends charms to love ! When the beauties of the beloved object are exaggerated in the lover's eyes ; when imagination represents his mistress as the perfect model of every excellence, and holds forth to his eyes his whole and only felicity as centered in the possession of her. Then only the lover becomes an enthusiast, and a flame is lighted up within him, which continues unextinguished for years. When at length he has enjoyed the object of his desires, the tender emotions of his heart continue after enjoyment, the charm remains when the delirium of the senses is no more. Refined charm ! Delightful sentiment ! Begotten by admiration, and fostered by esteem and respect ; it forms a chain which time cannot dissolve.

When cruel destiny has deprived a tender mistress of her lover, her wounded heart demands him from heaven ; in the
 excess

ON THE HUMAN SOUL. 259

excess of her grief, she attaches herself to his shade, moistens his cold ashes with her tears, and presses to her sad bosom, the urn in which they are inclosed.

The duration of the passions is likewise relative to their degree of force; for the succession of sentiments is ever in proportion to their vivacity, as is that of physical sensations. This is evident from the predominant passion, that furious despot which reigns uncontrouled in the soul, where he keeps the sway for years, and even till the body drops into the grave.

Of the Life of the SOUL.

Deprive Man of the desire of happiness, of the love of pleasure, and of aversion to pain; he is easy in the present moment, unconcerned for the future and devoid of care: he will neither take the trouble to think nor reflect, and having no interest to prompt him, will continue inactive, and his soul sink into a lethargic indolence. The passions are the life of the soul, and the soul of the moral world, impart motion to our faculties, and give activity to every sensible being. It is aversion to pain that rouses animals from their repose,

260 ON THE HUMAN SOUL.

and prompts them to seek for food ; the horse, the green herb, and Man his prey. It is love of pleasure that excites every animal to delight in the society of his own species, that impels the sexes to seek each other, and unite in nature's mystic rites. The love of gold tempts Man to expose himself to the fury of the waves, makes him venture across oceans, and is the incentive which urges him to continual toils. The love of glory warms the heart of the philosopher and hero, prompts them to consume life, the one, in the search of wisdom, the other, in the toilsome exercise of virtue. The thirst of fame, ambition, avarice, fear, love, hatred, or all the passions united, intice men to take arms, inflame them with mad fury, rouse them to battle, till rushing on each other, sword in hand, the earth is strewed with dead bodies, and the fields are glutted with slaughter.

Like an impetuous wind, the passions raise their voice, impel man to action, and incessantly urge him to bustle, in spite of all those allurements of a quiet and pacific life, which would have kept him inactive.

Absurd

*Absurd Opinion of Philosophers on the
Force of the SOUL.*

The life of the soul consists in its being animated with the passions ; the force of the soul consists in restraining and subduing them to reason : but in what manner does the soul govern them ? Hear what the philosophers say, “ Two principles
“ prevail in Man ; the passions to rouse,
“ and reason to controul him : this governs, that animates him ; the passions
“ impel the soul to action ; reason directs
“ it and restrains them ; by this the passions are curbed, and the soul presides.”

Vain declamation ! Let us leave these philosophers to make passions and reason two contrary principles, and suppose them as opposite in their natures as they please, they will never be able to make calm reason a counterpoise to impetuous desire and strong sentiment.

To conquer a passion, nay, even to will it, the soul must consider and examine the reasons why it is to act in this manner, and why it ought to refrain from acting ; it must shew the superior advantage of rest to action ; but as the impulses of senti-

262 ON THE HUMAN SOUL.

ment are rapid, so the arguments which reason suggests proceed but slowly, and the passions have already determined Man, before he can deliberate on what he ought to do. For the passions feel the present good ; and reason only foresees in the consequences of things, the good which is to come : the objects of the passions strongly affect us, as being present to the sight ; whilst those of reason are impaired by their remoteness, and always yield to the impressions of the passions.

O reason ! thou boasted recourse of the wise, how can thy feeble voice prevail against the violence of the passions ? What effect can it produce on a soul in despair, or overpowered by the fury of the senses ? Since the assistance thou givest appears so little efficacious, allow me to doubt, whether at that time, thou art capable of administering any.

When affected with the tumultuous passions, the soul does not reflect, nor can the voice of reason be heard * : like a pilot in a vessel that has lost its anchor, and is tossed at the pleasure of the winds ; overcome by the fury of the tempest, he quits

* See Art. on the exercise of the understanding. Book 2, pag. 201.

ON THE HUMAN SOUL. 263

the helm and lets it drive, and is himself an useless incumbrance in the vessel which he can no longer govern.

Such is the boasted power of reason! How vain then is wisdom, since it leaves Man defenceless in the time of danger, and only affords him assistance when it is not wanted!

In the impetuous passions, the soul, unable to make any opposition, gives way to their violence, calm reason is silent; or, if it retain any small share of activity, it serves only to render them yet more ungovernable. Wholly intent on some present enjoyment, like the predominant sentiment, it is seduced by the allurements of voluptuousness, and acts in concert with it, in pursuing the same object. A passive slave during the tempest, no sooner is it subsided, when, instead of administering comfort in our misfortune, it joins with the sense of our unhappiness, and assists it in depressing the heart. An helpless friend in danger, it abandons us in our necessity, goes over to the enemy, and returns not till after we have succumbed, and then only, to add to our confusion. Thus ever applauding or censuring, when it is too

264 ON THE HUMAN SOUL.

late, it can only serve to give its sanction to our errors *, or to punish us, when we have committed them, with an useless remorse. Thus the soul, having no defence against the passions, is carried away by their violence, and Man is necessitated to surrender to sentiment. The empire of reason therefore consists altogether in our having no passions either to repress or subdue.

To how little an extent is this power of the soul reduced ! How trivial this prerogative, in the enjoyment of which philosophers have so greatly exulted !

*A right Judgment of the Force of the
SOUL.*

In the course of human life, wherein Man is so variously affected, the passions are the only principle of his actions ; but it is not action which constitutes the force of the soul, it is the resistance which the soul opposes to the passions,

Who then can properly be said to be endowed with force of soul ? Not a boi-

* See Book 2. pag. 223. Art. Some singular phenomena explained, concerning the effects of the passions on the understanding ; and the Art. Natural succession of thoughts. p. 210.

terous *Achilles*, regardless of every danger; not an ambitious *Alexander*, who laid waste the globe with fire and sword; not an austere *Cato*, who tore out his bowels with his own hands*: as they were alike unable to withstand their passions, so they all fell victims to them; the first, to his ambition, the second, to voluptuousness, and the last, to grief. The man who despises pleasure and pain, faces danger without fear, receives, with indifference, the strokes of adverse fortune, and sustains them with an easy firmness, He, in my opinion, is truly endowed with force of soul. In morals as in physics, force is distinguished into active and passive; but let us distinguish ever so often the faculties of the soul from each other, and the soul itself from its faculties, we shall never perceive any thing like these two kinds of power in Man; we may, indeed, perceive an active power, viz. sentiment, but never any counterpoise. Not that it is impossible to restrain the impetuosity of

* Every person committing suicide, desires only to avoid the sight of his miseries, which he cannot endure with patience: death is not an object of fear to him; it is life only which he dreads.

266 ON THE HUMAN SOUL.

the passions ; this may be done, doubtless, by opposing the one against the other, that is, by subjecting the soul to many, in order to deliver it from the tyranny of one. Man, therefore, being thus the feeble sport of his passions, is continually necessitated to submit to their tyranny ; just as a slave, condemned to perpetual servitude, is ever changing his masters, and has it not even in his power to chuse what tyrant he will serve.

Let us then conclude, that if the force of the soul consists in commanding our passions, none can, properly speaking, be said to be endued therewith : whatever has been advanced on that head is absurd ; for to destroy the empire of the passions, we must destroy sensibility itself.

Of the feigned Force of the SOUL.

“ Were not *Socrates*, who calmly drank
 “ the poisoned bowl ; *Seneca*, who expired in the bath, conversing with his
 “ friends ; *Zeno*, who overcame both pleasure and pain, and denied himself every
 “ thing which might enervate the soul,
 “ endued with this force of the soul ? ”
 Do you imagine these sages did not act
 under

under a mask ? Do you think that *Socrates* or *Seneca* met death without apprehension ? From the bitter reproaches which one of them uttered against the tyrant, who had commanded his execution, is it not evident, that he yielded unwillingly to his destiny ? And even, if the other had not demeaned himself so as to plead his cause, and if his soul, prepared by the continual exercise of wisdom, had not given that mark of timidity, who can allow himself to believe, that *Socrates* did not act a borrowed part ? In vain he endeavoured to conceal his inward feelings, under an air of serenity, and an unfaltering voice ; the soul trembled within him, and his trouble must have appeared, notwithstanding this vain disguise, to a discerning spectator. The prospect of a painful death will always strike terror ; none can view it without shrinking : the wretch who, overwhelmed in despair, has resolved to take away his own life, and calls on death to help him to strike the blow, hesitates ; his arm, though lifted up, refuses to strike, and he is forced to inflame his resolution with the recollection of his misery, till summoning all his resolution and

despair

despair itself, at last he perpetrates the deed, but not without turning his head aside from an act which he dares not behold.

The force of the passions is proportionate to the degree of sensibility, and the degree of sensibility is only known by the force of the passions. When the heart is free from every connection, and all sensibility is centered in the mind, Man appears insensible; he can even believe himself to be so.

When the object of the passion affecting the soul is such, that it may be enjoyed in silence, as that of pride, Man even then appears insensible; but it is to others only, for his sensibility is not unknown to himself. We cannot perceive the passions of others but by their exterior appearance, yet they exist not the less for their not being visible. What would become of the principle of human actions, were Man divested of sensation and sentiment? What motive taken from their own fund could tardy wisdom or calm reason supply.

When Man has discovered the secret of restraining the passions, by making them act one against the other, and of forming them
in

in battle array, and, as it were, front opposed to front, in the heart, he has found that of balancing the soul, preserving it in an equilibrium, concealing his inward smart under a serene outside, and imitating that true calm of the heart, which participates of the nature of insensibility; outwardly he appears tranquil, but trouble rages within. Thus *Camillus* concealed his resentment; *Fabius*, his thirst of fame; and *Decius*, the love of life under love of their country. Thus the austere stoic, transported with the love of glory, conceals, under an haughty indifference and disdainful gravity, his love of pleasure and aversion to pain.

It was not force of soul that prevented *Socrates* from revealing his trouble and venting his tears,—it was a noble pride. After so many past efforts, he must sustain his character to the last, make a virtue of a necessity, and terminate victoriously a life of perpetual conflicts.

“ The whole world have their eyes up-
 “ on thee, be mindful of thy glory; thy
 “ long life has been spent in making a
 “ parade of bearing adversity with firm-
 “ ness; down, down, my grief, deprive
 “ me

"me not at my exit from life, of the
 "sole reward of my constancy." Thus
 said *Socrates* tacitly to himself, and would
 have spoken it aloud, had he dared.

Let Man do his utmost, in vain will he
 pretend to be exempt from fear, and
 from the yoke of the passions; he obeys
 them continually without perceiving it,
 even at the time when he is enjoying his
 imaginary triumph.

When *Diogenes* crowned himself with
 his own hands at the *Isthmian* games, and
 proclaimed himself superior to pleasure
 and every human vanity, he was the slave
 of pride.

Let us then conclude, that the force of the
 soul is a merely apparent quality, is often
 even nothing but weakness under the mask
 of strength. Such is the nature of this so
 much boasted and fallacious virtue, in
 which the shadow is often substituted for
 the substance, and the appearance, for the
 reality.

Man is perpetually the slave of his pas-
 sions; however, all men are not under
 this universal servitude in an equal degree;
 their subjection is greater or less in pro-
 portion as the passions are more or less vio-
 lent,

lent, as they are in a greater or less combination, and as these combinations are more or less strong; for the force of the soul is in an inverse proportion to sensibility. Heroes, who are celebrated for being endued with force of soul, are more the slaves of their passions, than the indolent and the fickle, who are agitated by the flux and reflux of opinion, constantly wavering between contrary impressions; their minds not having even the choice of their shackles, nor the power of changing them.

But what is more surprising, those sages so greatly renowned, and who pretend to possess this force of mind, are really the weakest of men. During the time they believe themselves superior to every passion, and are boasting of their victory, they are subject to the most imperious masters; for reason can never counterbalance one sentiment but by its opposite, nor restrain one passion but by a stronger: that is, it must free the soul from one kind of servitude, by subjecting it to another yet more severe.

END OF THE FIRST VOLUME.

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